MID-TERM EVALUATION OF THE TRADE IN ENVIRONMENTAL SERVICES AND TECHNOLOGIES (TEST) PROJECT

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EXECUTIVE SUMMARY

INTRODUCTION

This report is intended to serve more as a strategic planning document than a typical mid-term evaluation. That is because the evaluation has been largely overtaken by events; it is occurring less than one year before the Project Assistance Completion Date of TEST, and simultaneously with the mission's redesign of TEST to begin implementing in early 1997 the industrial component of USAID/India's new Clean Technology Initiative (CTI/I), an outgrowth of the Indo-U.S. Common Agenda for Environment. Thus, the focus of the evaluation has been on extracting lessons learned from TEST's experience to date, to help inform the substantial modifications already underway.

TEST PURPOSE, APPROACH AND ASSUMPTIONS

The purpose of TEST has been to "assist Indian industries to adopt environmentally sound practices while promoting sustainable linkages between U.S. and Indian firms."[1] The approach taken has rested heavily on a financing component; the original project design included: $25 million for financing (commercial loans and conditional grants, and grants to trade associations and other professional organizations); supplemental $10.8 million in financing from Host Country Contributions; and $5 million for technical assistance to facilitate commercial transactions.

Key assumptions included: Strong regulatory and market incentives for Indian industries to upgrade their environmental management; a growing Indian market for environmental services and technologies that are not currently available in India; technically and economically competitive U.S. know-how and technologies, with sufficient interest from potential Indian and U.S. partners; a severe shortage of financing options for commercial environmental technology transfer between India and the United States;[2] preferability of a "demand-driven" approach because the environmental market in India is too dynamic and varied to make targeting by sector, region, or environmental media advisable.

HOW WELL HAVE ACTIVITIES TO DATE MET THE GOALS OF TEST?

Both the Industrial Credit & Investment Corporation of India (ICICI), the Government of India representative and grantee, and Sanders International (SI), the U.S. institutional contractor have worked energetically on TEST and have satisfied their project commitments. Interviewees nearly always reported being very pleased with service provided by ICICI and SI.

TEST has clearly contributed to achieving Strategic Objective 5 of USAID/India's Mission Results Framework. Beyond this general conclusion, it is not possible to assess how well activities to date have met the goals of TEST. The types of commercial transactions at the core of TEST's design

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[1]TEST Revised Logical Framework Matrix.

[2]This point included the assumption that this need warranted offering assistance substantially beyond the level to be offered through the U.S. Asian Environmental Partnership (USAEP) program, which began at about the same time as TEST, in India and nine other Asian countries.

typically require up to a few years for the initial activity to blossom, and for the sustainability of new partnerships and multiplier effects (or the absence thereof) to become apparent. Detailed analysis of program impacts would require a longer time horizon, much more complete information, and more detailed analysis of existing information than is anticipated in the TEST logical framework or was possible during this evaluation.

URGENT NEED FOR MANAGEMENT DECISIONS

The team identified management issues that USAID and its institutional partners urgently need to address:

1. USAID and ICICI should promptly decide how to handle pending loan applications so as to minimize inconvenience to applicants and problems in program management. ICICI feels strongly that about $5-6 million should be awarded for loan applications currently in the pipeline. This would have major implications for the redesign of TEST because of the amount of money involved, unless this money would come from source other than projected funds for CTI/I.

2. USAID should plan how to minimize potential disruption between the end of Sanders International's contract on January 31, 1997 and the time when a new contract for coordination of technical assistance is awarded. USAID expects to redefine the role of the U.S. institutional contractor for TEST and to award a new contract in early 1997. If there will be a significant delay until this happens, USAID intends to identify a mechanism to enable SI to continue serving in the meantime.

LESSONS LEARNED FROM THE TEST EVALUATION AND IMPLICATIONS FOR CTI/I

1. TEST should distinguish among markets for:

   a. New and/or growing, forward-looking industries;

   b. Older, mostly medium- or small-scale industries; and

   c. Environmental services.

2. A major financing component for TEST is no longer appropriate. It appears to the evaluation team that there is now adequate financing available in India for promising commercial transactions with environmental benefits.[3] However, the team recommends considering a limited financing component for demonstration projects of pollution abatement technologies that can readily be implemented on a wide scale, if the tested technologies prove environmentally and commercially viable.

[3]ICICI does not agree with this conclusion, as explained in the main report in Part III.G.1.

3. Special commercial services to TEST participants have clearly facilitated some commercial transactions, but there is no ready way to evaluate the cost-effectiveness of this TEST program component. Therefore, the special commercial services should either become self-supporting or else be evaluated to determine whether the extra program costs are justified by resulting environmental and economic benefits.

4. CTI/I will present increased opportunities and needs for TEST to expand its partnerships, most importantly with USAEP and a broader range of Indian institutions.

5. For some of the new measures to be adopted, TEST will need to shift from its demand-driven approach to a more targeted focus (e.g., by sector, region, or environmental issue), to enhance program implementation and performance monitoring.

6. For CTI/I, there should be more focus on how to design performance indicators and how to monitor performance:

   a. As USAID already recognizes, Strategic Objective 5 in its Mission Results Framework (improved air and water quality at selected industrial sites and municipalities) needs to be re-evaluated in light of CTI.

   b. Performance indicators and the structure of performance monitoring should reflect the need for longer time horizons to evaluate project impacts.

   c. It is important to maximize learning from the initial three-plus years of TEST.

   d. USAID should structure reporting requirements for TEST to facilitate project monitoring and evaluation.

   e. USAID should consider making tracking and analysis of TEST performance itself a performance indicator, at least for the next 2-3 years.

CONCLUSION

The first phase of TEST occurred during a time of rapid change in India's environmental market. The most important driving forces appear to be economic liberalization and globalization (for pollution prevention) and judicial activism linked to citizens' lawsuits (for upgrading of older facilities). USAID's plans to redesign TEST for CTI/I are consistent with the results of this evaluation. Overall, the most crucial "lesson learned" for CTI/I may be the need to strengthen design, monitoring and reporting for project indicators, to enhance feedback for ongoing project improvement. This is particularly important since TEST is intended as a "cutting edge" project, with potential as a catalyst for other U.S. Government programs and other international donors.

MID-TERM EVALUATION OF THE TRADE IN ENVIRONMENTAL SERVICES AND TECHNOLOGIES (TEST) PROJECT

I. INTRODUCTION

A. PURPOSE OF THE EVALUATION

This report is intended to serve more as a strategic planning document than a typical mid-term evaluation. That is because the evaluation has been largely overtaken by events. It is occurring less than one year before the Project Assistance Completion Date (PACD) of TEST (i.e., after completing more than four years of a five year project); and simultaneously with the mission's redesign of TEST to begin implementing in early 1997 the industrial component of USAID/India's new Clean Technology Initiative (CTI/I), an outgrowth of the Indo-U.S. Common Agenda for Environment (CAE). Thus, the focus of the evaluation has been on extracting lessons learned from TEST's experience to date, to help inform the substantial modifications already underway. Time and resource constraints made it impossible for the team to consider all issues in detail; additional study may be necessary in order to decide how (or whether) to implement some of the recommendations. The USAID project evaluation data sheet is attached in Appendix 19.

B. STUDY QUESTIONS

The main study questions were:

1. How effectively did the TEST implementing institutions, the Industrial Credit & Investment Corporation of India Ltd. (ICICI) and Sanders International (SI), carry out their obligations?

2. How well did activities to date meet the goals of TEST? What were the economic and environmental impacts, and what were the key factors influencing them?

3. How can TEST be redesigned most effectively to meet the goals of CTI/I? What were the lessons learned from TEST, and what is their relevance to CTI/I?

C. ORGANIZATION OF THIS REPORT

The evaluation report is organized as follows:

I: Introduction

II: Background Information about TEST

III: Evaluating Performance to Date under TEST

IV: Lessons Learned from the TEST Evaluation and Implications for CTI/I

V: Conclusions

Appendices include:

1. Bibliography

2. People interviewed

3. Summaries of interviews

3A. ICICI comments on Appendix 3[1]

4. International programmes of assistance in environmental services and technologies

5. Significance for the TEST project of environmental regulatory measures

6. Market for environmental services and technologies

7. ICICI, "Possible Business Opportunities in the Paper Industry", internal memorandum (August 2, 1996)

8. ICICI, TEST Programme: Eighteenth Status Report (October 31, 1996)

9. ICICI, TEST PROGRAMME: List of Applications Rejected (11/21/96)

10. Sanders International, Spread Sheet on TEST Technical Assistance Cases (November 7, 1996)

11. Sanders International, TEST Status Report - October 1996

12. USAID/India, Quarterly Project Financial Management Report, Vol. 1, p. 34-35 (September 30, 1996)

13. USAID/India, TEST (386-0530) Control Subledger, printout provided by V. Chatterjee (November 12, 1996)

14. Potential measures for the industrial component of CTI

15. Delivery Order Statement of Work (TEST mid-term evaluation)

16. ICICI, Criteria for Assistance in the Form of Loans and Conditional Grants to Companies (excerpt from document entitled, Trade in Environmental Services and Technologies (TEST) Programme) (September 1993)

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[1]The team received them too late to incorporate them into Appendix 3.

17. ICICI, Policy Note for Grants to Trade and Professional Associations (September 1996)

18. TEST Logical Framework Matrix

19. U.S. survey questionnaire and tabulated survey responses

D. TEAM COMPOSITION AND STUDY METHODS

The study team included:

1. Faith Halter, Team Leader, specialist in environmental policy, law and institutions

2. Robert Spongberg, Engineer, management consultant and specialist in energy conservation, environment and related technologies

3. Paritosh Tyagi, Engineer and Solicitor, former Chairman of India's Central Pollution Control Board and the Uttar Pradesh Pollution Control Board.

The team used the following study methods:

1. Review of documents (Appendix 1 contains a bibliography);

2. Interviews (Appendix 2 contains a list of interviewees; Appendix 3 summarizes interviews with Indian participants in TEST, Indian trade associations and international donors; Appendix 3A contains ICICI comments on Appendix 3 that the team received too late to incorporate):

    a. Representatives of ICICI and Sanders International;

    b. USAID/India staff working on TEST;

    c. Representatives of Indian companies and organizations participating in TEST or with activities relevant to TEST, located in Bangalore, Chennai (formerly Madras), Delhi, Hyderabad, Ludhiana and Mumbai (formerly Bombay);

    d. Representatives of USAEP and the U.S. Foreign Commercial Service (USFCS) in Delhi and Mumbai (USAEP only);

    e. Representatives of international donor agencies (Appendix 3 contains summarizes interviews with the Asian Development Bank and World Bank. Appendix 4 summarizes international environmental assistance relevant to TEST);

    f. The consultant helping to design CTI/I, who was also working in India during the first half of the TEST mid-term evaluation; and

3. Briefings with USAID/India.

4. Survey of U.S. participants in TEST (Appendix 20).[2]

[2]The evaluation schedule did not allow sufficient time for the team to interview U.S. participants in TEST. The team attempted to remedy this by faxing a questionnaire to 55 U.S. companies recommended by Sanders International. The response rate was low (ten completed questionnaires, with several additional companies reporting that their involvement with TEST was too limited to enable them to reply) and the information arrived too late to be analyzed by the evaluation team. Appendix 20 provides a copy of the original survey and then a tabulation of survey responses.

II. BACKGROUND INFORMATION ABOUT TEST

A. PURPOSE, STRUCTURE, APPROACHES AND ASSUMPTIONS

The purpose of TEST has been to "assist Indian industries to adopt environmentally sound practices while promoting sustainable linkages between U.S. and Indian firms."[3] The approach taken has rested heavily on a financing component; the original project design included: $25 million for financing (commercial loans and conditional grants, and grants to trade associations and other professional organizations); supplemental $10.8 million in financing from Host Country Contributions;[4] and $5 million for technical assistance[5] to facilitate commercial transactions. TEST received final approval in October 1992. The basic prerequisites to project start-up were completed by Summer 1993, when project operation began. The Project Assistance Completion Date (PACD) is September 30, 1997.

ICICI serves as the representative of the Government of India (GOI) for TEST. ICICI is responsible for the financing components of TEST and related awareness-building, which it administers through the TEST Group, within the Division of Technology Products and Services.[6] Sanders International, Inc. is the U.S. institutional contractor responsible for providing technical assistance under TEST,[7] in cooperation with ICICI and other U.S. Government programs, most notably the U.S.-Asia Environment Partnership (USAEP).

Key assumptions underlying the design of TEST included: Strong regulatory and market incentives for Indian industries to upgrade their environmental management; a growing Indian market for environmental services and technologies that are not currently available in India; technically and economically competitive U.S. know-how and technologies, with sufficient interest from potential Indian and U.S. partners; a severe shortage of financing options for commercial environmental technology transfer between India and the United States; the need for a "demand-driven" approach because the environmental market in India is too dynamic and varied to make targeting by sector, region, or environmental issue advisable.

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[3]USAID/India, TEST Logical Framework Matrix (1/30/95). The most recent TEST logical framework matrix is attached in Appendix 18.

[4]The Host Country Contribution (HCC) is the amount of money and in-kind contributions that TEST borrowers provide to projects financed by TEST.

[5]Elements of TEST technical assistance include: project awareness; trade and investment tours; information networks; helping Indian industries to identify U.S. environmental services and technologies; and matching potential partners for joint ventures and licensing agreements.

[6]ICICI also administers the financial component of several other USAID energy and environmental projects, as well as much larger environmental lines of credit established by the World Bank.

[7]Before SI's contract began, there was an interim institutional coordinator for TEST. There was no information about the interim institutional coordinator and this mid-term evaluation of TEST did not address its performance.

B. ECONOMIC, POLITICAL, SOCIAL AND ENVIRONMENTAL CONTEXT[8]

India has a population of 936 million, growing at 1.91% annually. Its population is projected to exceed that of China in the early 21st century. About 39 percent of India's citizens are considered "extremely poor," with per capita income below U.S.$275. 30 percent of the urban population (about 80 million people) live in slums in 23 major cities. There is widespread infant and child mortality and malnutrition, as well as low female literacy and a decreasing ratio of females to males.

India has substantial mineral and biological wealth, but only .4 percent of world energy reserves. Economic isolation, ineffective policies and excessive regulation have hampered economic growth. India undertook a major program of economic liberalization in 1991, but there are still substantial restrictions, compared to other Asian countries. India needs to increase its annual growth rate from the current 6 percent to 8-9 percent in order to generate the 10 million jobs needed annually for its rapidly growing work force.

Beginning in the 1950s, India's development strategy promoted energy-intensive, heavy industry. Energy production and distribution and other heavy industry remain largely in the public sector, despite a recent emphasis on private investment and ownership, including privatization of government services and facilities. Deeply entrenched policies support subsidies for energy and water that favor farmers and the poor, but discourage energy and water conservation.

The World Bank has estimated that environmental degradation in India causes annual damages of at least $9.7 billion, of which about $7 billion is due to air and water pollution. Major environmental problems include: severe air pollution in six of the largest cities; scarcity of surface and groundwater; grossly inadequate municipal sewerage and waste management; and extremely limited industrial effluent treatment, especially among more than 2 million small- and medium-scale facilities scattered throughout the country.

Industries are subject to comprehensive environmental regulation. (See Appendix 5). The Central Pollution Control Board oversees enforcement of environmental requirements for industry by the State Pollution Control Boards, in cooperation with the Ministry of Environment and Forests and state environmental agencies. However, environmental enforcement by government agencies is generally ineffective. Judicial activism linked to citizen's environmental lawsuits is becoming an increasingly important force.

The estimated Indian market for environmental services and technologies (EST) has been expanding rapidly in recent years: $220 million (1990); $1,776 million (1994); and projections of $4,000 million (2000).[9] Annual increases of U.S. exports of environmental equipment to India increased

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[8]The source for the following information (except for the last two paragraphs on regulation and environmental markets) was USAEP Country Assessment: Republic of India (1996).

[9]Confederation of Indian Industry, Environment Management Division, New Delhi, Environmental Management and Business Opportunities in India, prepared for Sanders International under the TEST Project (October 1995). This report notes that in 1994, the Government of India widely circulated a list of pollution control technologies that local companies need to import. There was no information about how imports from the U.S. or other countries

(continued...)

by about 29 percent from 1992-95. As of early 1996, the U.S. had the largest share of environmental joint ventures with Indian firms (40 percent), followed by UK (21 percent), Germany (17 percent) and others (22 percent).[10] (See Appendix 6).

[9](...continued)
compare to this list.

[10]The evaluation team did not find information about the U.S. share of the environmental market with respect to (1) pollution abatement vs. clean technologies or (2) environmental services.

III. EVALUATING PERFORMANCE TO DATE UNDER TEST

A. RESPONSIBILITIES AND INSTITUTIONAL PARTNERS

1. Overview

Responsibility for implementing TEST has been shared by the Industrial Credit & Investment Corporation of India (ICICI), which provides loans and grants for technology development and commercialization, and Sanders International (SI), a U.S. consulting firm whose activities include environmental business development.[11] Their responsibilities include:

1. Assist in making Indo-U.S. linkages

   a. Miscellaneous networking and information distribution (mailings, brochures, participation in and/or organizing seminars and conferences) (ICICI and SI)

   b. Creation of TEST web site on the Internet (SI, with ICICI provision to eventually serve as a base in India)

   c. Creation of a TEST library at ICICI (ICICI, with help from SI)

2. Help Indian industry to identify possible U.S. partners

   a. General advice and assistance (ICICI and SI)

   b. Research reports to identify appropriate U.S. technologies and services and their sources (SI, with requests forwarded through ICICI)

   c. Investment tours and exchanges between the U.S. and India (SI, partly in coordination with the U.S. Asia-Environment Partnership)

   d. Miscellaneous other business facilitation (ICICI and SI, but more a function of SI)

3. Review and act upon applications from Indian companies and organizations for loans and conditional grants for commercial transactions with U.S. counterparts (ICICI, with the option to ask for SI review)

4. Review and act upon applications from Indian trade associations and business organizations for grants to strengthen information networks (ICICI)

2. Industrial Credit & Investment Corporation of India

[11]The original project design for TEST included an advisory council. This concept was dropped early in the project and USAID told the evaluation team that there was no need to review that decision.

ICICI serves as the GOI representative to TEST, and functions as a grantee, responsible primarily for administering the financing component. In early 1993, ICICI established a TEST Group; it includes two professional staff headed by a Senior Vice President, who reports to a Deputy General Manager.[12] The TEST Group is housed within ICICI's Technology Products and Services Division (TPSD). TPSD also administers three other USAID projects on energy and/or environment, and administers environmental funds for other donors, such as the World Bank and the German Government. Loans managed by TPSD range from $15,000-$200,000.

3. Sanders International

SI serves as the institutional contractor for TEST. In summer 1993, SI appointed a full-time TEST Coordinator, who receives support from a technical specialist and a financial analyst.[13] SI does not have a full-time TEST representative in India. SI's TEST coordinator visits India several times each year.

4. Cooperation between ICICI and SI

Originally, virtually all TEST activities were supposed to go through ICICI. However, this proved to be awkward, and so the TEST partners decided that it would be more efficient for ICICI to handle most activities based in India, and SI to do the same for the U.S., so far as this was consistent with their respective roles regarding financing and technical assistance. As a result, ICICI and SI often operate independently, with limited substantive interaction.[14]

B. TEST BUDGET

The projected USAID contribution to TEST was $25,000,000; the actual USAID contribution as of September 30, 1996 was $8,409,000.[15] The projected Host Country Contribution (HCC) was

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[12]The evaluation team was not able to assess the extent to which TEST has had an impact on ICICI overall. However, the following points may be useful to note: the TEST Group circulates general information to department heads through a "Possible Business Opportunities" notice (see Appendix 7); the ICICI information center is working with the TEST Group on an Internet site that could accommodate the TEST home page; and ICICI has recently created an Advisory Services Group that could potentially develop capacity to assist clients seeking environmental financing.

[13]As TEST was originally configured, SI headed a group of five subcontractors who were expected to assist with providing technical assistance. According to the SI TEST coordinator, there was not a good match with program needs, and consequently SI has handled technical assistance on its own, with occasional supplemental help through Indian contractors. However, it appears that some of the technical research reports for TEST clients were prepared by SI subcontractors.

[14]Their main point of contact seems be in the administration of requests for technical search reports. ICICI asked Sanders to provide technical review on two early loan applications to TEST. There may be a need for closer coordination on development and administration of a TEST web site to be based in India; SI developed the existing TEST home page with little input from ICICI, partly because Internet is still so new to India, and ICICI has only recently been developing its own Internet capabilities.

[15]USAID, TEST Project Implementation Letter (March 2, 1993); USAID, Quarterly Project Financial Management Report, Vol.1, September 30, 1996, page 34, 35.

$10,800,000; the actual HCC as of March 31, 1995 was $25,477,000.[16] A summary of the overall status of the TEST budget and spending appears in Appendix 12.

C. ELIGIBILITY CRITERIA FOR TEST

1. General Criteria

USAID made a decision to have TEST be "demand-driven," after evaluating project background studies on environmental and market conditions in India. Thus, there are only general eligibility criteria for Indian participants:[17]

1. Joint ventures for the manufacture of EST equipment and instruments;

2. Joint ventures for establishing EST consulting and engineering services;

3. Joint ventures for establishing EST analytical and testing facilities;

4. Concept evaluation of pollution control alternatives for specific facilities or industry projects to be undertaken by U.S. consulting firms in collaboration with Indian partners;

5. Projects proposed or developed by Indo-U.S. joint ventures and projects ready for commercialization under USAID's PACT or PACER projects.[18]

2. Criteria for financing

The TEST grant agreement between USAID and ICICI calls for ICICI to develop more detailed criteria for financing eligibility. ICICI developed criteria for loans and conditional grants in September 1993 (Appendix 16), and for grants to trade and professional associations in September 1996 (Appendix 17). ICICI also uses certain factors to screen out inappropriate applicants for TEST

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[16]USAID, TEST Project Implementation Letter (March 2, 1993); ICICI, Summary Statement of Host Country Contributions as on 31/03/95, Attachment A. ICICI is now preparing updated information on Host Country Contributions. According to the way that USAID calculates requirements for HCC, the actual U.S. contribution to TEST of $8,409,000 would have only required an HCC totaling $5,285,000. Thus, the actual HCC for TEST is very substantial. Information provided by V. Chatterjee and A. Ray, USAID/India.

[17]These criteria appear in the USAID TEST Project Agreement, Section J, p. J-5 (September 30, 1992).

[18]PACT and PACER are earlier USAID commercialization projects for energy and environment, for which ICICI also serves as the GOI representative. The concept for the Kothari Sugars project financed by TEST (see Appendix 3) was developed with assistance from PACT. Two companies whose TEST loan applications are pending were participants in PACER (Delta Mills and Caldyn).

financing.[19] So far as the team could determine, all financing activities have been consistent with these criteria.[20]

D. EVALUATION AND REPORTING OF TEST ACTIVITIES

1. Project indicators[21]

TEST falls within Strategic Objective (SO) 5 (improved air and water quality at selected industrial sites and municipalities) of USAID/India's Mission Results Framework. TEST certainly contributes to achieving SO5, but there is presently no way to measure specific impacts.

Most of the discussion of project indicators and performance monitoring appears in Part IV, regarding proposed changes to TEST for CTI/I. However, the evaluation team wants to emphasize the following points here, as an introduction to the review of TEST activities to date:

1. The types of commercial transactions at the core of TEST's design typically require time horizons of a few years for the initial activity to blossom and/or for the sustainability of new partnerships and multiplier effects (or the absence thereof) to become apparent.

2. Reliable measurement of environmental and/or market impacts from TEST activities to date, if possible at all, will require more time and more input of resources than is currently envisioned in the logical framework matrix for TEST.[22]

3. The interim results indicators for TEST in 1995-96 seem to have been set by "working backwards" from anticipated TEST activities. This is understandable, given limitations in baseline and ongoing project data about environmental

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[19]These factors include: conflict with USAID policy; no direct Indo/U.S. linkages established; loan application made by a party other than the company that would actually implement the project (e.g., a parent company, supplier company or client company); other USAID funding source being considered; lab scale trial unsuccessful; or applicant unable to get working capital. (See Appendix 9.)

[20]The team did not attempt to evaluate the financing criteria developed by ICICI and approved by USAID. This did not seem to be a good use of very limited time, since the financing component may be changing substantially. If the financing component does not undergo much change for CTI/I, then the team would recommend evaluating the financing criteria in light of this report and the final redesign of TEST for CTI/I.

[21]Information in this section is drawn from USAID, INDIA: Results Review and Resource Request (R4) (April 1996) and discussions with TEST staff.

[22]Existing baseline data on both environmental and market issues seems to be limited to facilities and operations of individual TEST borrowers. The team did not have time to evaluate the quality or implications of the data provided by TEST borrowers. Building an adequate database to assess broader impacts (beyond individual TEST borrowers) could be difficult and costly. Structuring TEST activities around clustered industrial facilities, which will occur in some of the measures under CTI/I, would be one way to generate more visible and more readily measured impacts.

conditions and markets. However, even in the short term, the interim indicators and results do not seem to provide very meaningful information.[23]

4. Aside from the limited environmental and market data, it is difficult to evaluate how much credit TEST can or should claim in terms of impacts from its financing activities to date, since most of the projects that have received loans or conditional grants from TEST were well underway before their TEST involvement[24] and all the borrowers interviewed apparently could have been financed from other sources, though perhaps not as quickly.[25] These activities can probably most usefully be viewed as part of TEST's "learning curve," and ultimate conclusions about TEST's contribution through financing should rest partly -- perhaps largely -- on how effectively TEST can promote longer-term value from these transactions.[26]

2. Reporting

In many cases, ICICI and SI are reporting on different companies and organizations -- a reflection of their largely independent activities. There is some overlap between ICICI's and SI's reports, where both have had dealings with the same Indian company or organization (though the information reported is not always consistent). During the evaluation team's visit, USAID/India was working with ICICI to reconcile the information in their respective reports. Some of the documentation produced by ICICI, SI and USAID appears in Appendices 7-11.

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[23]The intermediate results indicators for TEST were 15 companies manufacturing clean technologies and $40 million in annual sales of clean technologies. The reported results were 10 companies and $37 million in sales. ICICI apparently recommended the targeted sales figure of $40 million based on projected sales resulting from projects with active loans; the results seems to indicate that the borrowers' sales projections were fairly accurate, though it is not possible to say even this for certain without more information than was available.

It was not possible to evaluate the claim for a 97 percent reduction of air pollutants at eleven plants using equipment manufactured by one of TEST's borrowers. (See the Kirloskar interview in Appendix 3) and USAID, INDIA: Results Review and Resource Request (R4), Annex A, p. 35 (April 1996).) This figure certainly indicates a great improvement in air quality. However, one would need much more complete information about issues such as the baseline situation in the affected area at each plant, the types of air pollutants (probably particulates), and performance over time to be able to estimate environmental impacts and assess their significance.

[24]According to SI, TEST was instrumental in helping to establish the commercial partnership in at least two cases: Agro Pulping Machinery had not identified a specific project before participating in TEST (this information did not come out during the evaluation team's interview, see Appendix 3); and Pneumafil and its U.S. partner were not in communication before participating in TEST (the evaluation team did not interview either company).

[25]The evaluation team interviewed six companies that have received TEST loans, plus one intermediary company (Agro Pulping Machinery). In each case, the interviewee(s) indicated that there were other available sources of financing, though not always on terms as favorable as TEST provides. (See interviews with Agro Pulping Machinery, DI Filters, Ignifluid Boilers, Kirloskar, Kothari Sugars, Shreyans and TTG Industries in Appendix 3).

[26]"Promoting longer-term value" could include promoting wider understanding and adoption of successful improvements carried out by TEST borrowers, as well as effective monitoring and analysis of these projects to help inform future TEST activities.

Both ICICI and SI appear to satisfy all the reporting requirements established by USAID, and USAID in turn appears to update its own TEST records regularly. However, the team found that although there were regular and sometimes voluminous reports, the information was not presented initially or later collated so as to present a composite picture of TEST accomplishments (and weaknesses). Instead, there was a mix of general classification of the type of environmental activity,[27] environmental baseline and test data for borrowers' facilities, project costs and sales figures, and anecdotal information. Part IV.E. below suggests some ways to improve project reporting and monitoring.

E. TEST FINANCING ACTIVITIES TO DATE

1. Overview

Interviewees were generally very complimentary about the work of ICICI. A few said that response and "turnaround" time on documents was a bit slow.

TEST financing activity has involved loans to nine companies (one loan was paired with TEST's only conditional grant) and one grant to a trade association. A comparable number of commercial transactions have taken place with only technical assistance from TEST (see the following section on TEST Technical Assistance Activities to Date).[28]

The reduction in USAID funding for the financing component obviously reduced the amount of money available for loans, but this probably has not had a significant impact, since (1) obtaining a loan from TEST was not reported as a critical factor by any of the companies interviewed; and (2) a comparable number of commercial transactions were linked to TEST technical assistance, without financing. According to ICICI, delays in disbursement of funds from USAID to ICICI had little adverse impact, and did not cause any clients to terminate their loan applications.[29]

There did not seem to be any reliable way to estimate environmental or market impacts. This was partly due to the recent nature of many transactions, but also due to the lack of general data on markets and environmental conditions.

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[27]The characterizations used by ICICI need to be clarified. ICICI's reports sometimes put loans and conditional grants into three categories (pollution prevention, pollution treatment/abatement, services) and other times into five categories (pollution abatement, pollution prevention, pollution treatment, pollution services, clean manufacturing process). E.g., ICICI Eighteenth Status Report, p. 8-10 and 20-21 (Appendix 8).

[28]ICICI and SI report a total of about 25 "linkages," which appears to mean completion of commercial agreements. The team was not able to verify this number precisely, but it seems to be reasonably accurate. The team was able to identify about 17 Indian companies that have reached substantial or final (contractual) agreement with a U.S. counterpart (in a few cases, the same Indian company has separate agreements with more than one U.S. company), plus one more loan that ICICI approved but later withdrew for lack of activity.

[29]One company reported that it lost interest in two possible projects after delays in response from ICICI, but there is no indication that the delays were related to disbursement of funds, or that the company aggressively tried to pursue its applications to ICICI. (See MIL interview in Appendix 3).

2. Loans

Term loans, which do not have to be paid in U.S. dollars, have an annual interest rate that is set about 1.5-3 points below the standard lending rate for commercial loans in India. TEST loans will provide up to 65% of project financing. ICICI maintains a reflow account for repayments of TEST loans; this money will be used to finance similar activities after completion of the TEST project.

Active loans. ICICI has disbursed 12 loans totalling 218.6 million INR ($7 million) to ten active project participants.[30] Of these ten companies, two successfully applied for a second TEST loan to address new environmental problems that arose in the same project.[31] Most of the Indian and U.S. partners identified each other without help from TEST and the Indian borrowers could have (and sometimes did)[32] receive funding from other sources, though not always on as favorable terms. The availability of loan financing from TEST may have accelerated the commercial process in some cases, but otherwise it did not appear to play a critical role in "making the transaction happen," so far as the team could determine from interviews with borrowers.[33]

All borrowers have been repaying their loans on schedule. As of September 30, 1996, gross reflows (including interest earned on investment of reflows) totaled 48.94 million INR.

Pending loan applications. ICICI has 8 loan applications that have been approved for consideration, or appear to meet the criteria for approval. Another 7 applications are currently being appraised or waiting for appraisal to begin. Six of these 15 firms have received technical assistance from SI. It appears that all the applications are for loans (as opposed to conditional grants). USAID and ICICI should promptly decide how to handle these loan applications, given the possibility of loan financing being eliminated or severely reduced from TEST as modified for CTI/I (see Part IV below).[34]

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[30]One additional loan, to Ignifluid, was subsequently canceled. The U.S. partner of Ignifluid was bought by a Norwegian company that was not interested in pursuing the Indo-U.S. relationship. (See Ignifluid interview, Appendix 3).

[31]In one case, the company began acquiring different raw materials that contained arsenic, which created a new environmental problem; in the other case, the company needed to obtain new software to improve operation of the air pollution control equipment that it had obtained with TEST financing.

[32]One company, Kothari Mills, actually had a complete loan package from the Industrial Development Bank of India and canceled part of that loan after the TEST Group urged Kothari to apply for partial funding from TEST. (See the Kothari interview summary in Appendix 3 and ICICI comments in Appendix 3A).

[33]Both ICICI and SI have commented that they think interviewees underestimated the importance of obtaining TEST financing. However, the team was careful to explore this specific point in each interview with a borrower. Perhaps the U.S. parties in these transactions perceived the TEST financing as more critical than did the Indian borrowers; unfortunately, there was no opportunity for the evaluation team to interview U.S. participants in TEST. It was not possible for the team to determine before completing this report whether any of the survey responses from U.S. companies (see Appendix 20) came from the partners of Indian borrowers who were interviewed.

[34]ICICI estimates that in the next six months, it will approve loans currently in the pipeline totaling about $5-6 million (this amount is close to the total proposed two year budget operating budget for CTI/I, see Part IV.A. below). ICICI feels strongly that TEST should authorize approval of these loans, even if there is a decision to restrict the TEST (continued...)

Loans rejected. ICICI rejected loan applications from twelve firms. (See Appendix 9.)

3. Conditional grants

Conditional grants are available for demonstrations or other testing of high risk commercial projects. These grants may finance up to 50% of project costs. The repayment terms are more favorable than for TEST loans. There is no interest assessed, and payment is not due until the project proves to be successful. If the project is not commercially successful, then the borrower does not have to repay the loan, which ICICI will "write off" as a grant.

As of October 31, 1996, TEST had issued only one conditional grant, in the amount of 14,700,000 INR, to Shreyans Industries. This conditional grant was part of an assistance package that also included a loan of about 38,500,000 INR. (See the Shreyans Industries interview in Appendix 3.) The conditional grant was for acquiring the technology, which had not been applied before in India, and for which Shreyans was reluctant to pay a high interest rate. The loan was for more conventional, associated expenses.

4. Grants to trade associations and other professional organizations

ICICI and USAID agreed to delay financing activities for trade associations and other professional organizations so that there would be more time for ICICI to survey potential candidates and develop criteria for these grants, which constitute a small portion of TEST financing. ICICI recently issued the first TEST grant, 1 million INR to ATIRA, the leading Indian textile research institute, to establish an environmental information network through Internet connections. Three other requests for grants are pending, totalling 7.5 million INR.[35]

F. TEST TECHNICAL ASSISTANCE ACTIVITIES TO DATE

1. Overview

Most interviewees were very pleased with the assistance they received from SI. Only one company said that it did not feel adequately supported by TEST technical assistance (see Vimta Labs interview in Appendix 3). SI has been aggressive in tracking leads and promoting matches between U.S. and Indian companies (e.g., see MIL interview in Appendix 3). There have been instances where an ongoing SI presence in India would have helped to monitor a technical assistance case more effectively and make an earlier decision to either help resolve difficulties or terminate TEST involvement (e.g., see MIL and Agra Iron Foundry Association interviews in Appendix 3).

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[34](...continued)
financing component under CTI/I. Moreover, while ICICI has not yet fully evaluated the current CTI/I proposal, it feels strongly that TEST financing should not be reduced, for reasons summarized in Part III.G.1. below.

[35]One of them, an application from the Technology Transfer Association (TTA), has been under discussion since 1993; the proposal seems to be for a very worthwhile purpose, but there are serious questions about institutional criteria and sustainability because TTA is a "one-man" NGO. (See the TTA interview in Appendix 3).

ICICI reports that TEST has responded to 781 "inquiries."[36] This figure appears to include any contact, however slight. More useful are the data on various types of technical assistance activities, although information from ICICI and SI do not always match.

Appendix 10 contains a table that SI prepared recently, showing the status of 92 TEST contacts with Indian companies to which it has provided varying levels of support. Seventy-four percent of the 92 Indian organizations became involved with TEST in 1993 or 1994. According to this table, 49 cases are still active and 43 have been closed.[37] Of 24 cases where SI devoted considerable effort (a score of 4 or 5), 4 companies concluded commercial transactions through ICICI and 5 have loan applications pending with ICICI. SI also ranked all nine of the companies that concluded commercial transactions without TEST financing as receiving a high level of technical support.

The evaluation team found some discrepancies in SI's table, mostly having to do with the status of progress (the SI report tended to be a bit optimistic sometimes). Some inaccuracies are inevitable given the number of cases being tracked and the lack of an SI institutional presence in India.

2. Commercial transactions supported by technical assistance from TEST, without any TEST financing

As noted above, of the 49 cases listed as still active in the SI table in Appendix 10, nine Indian firms appear to have entered into partnership with U.S. firms after obtaining a research report from TEST and/or participating in an investment tour sponsored by TEST alone or in conjunction with USAEP. In at least one case, the Indian company is likely to enter into commercial agreements with several different U.S. firms for different projects. (See the Electronics Corporation of India interview in Appendix 3).

3. Seminars and conferences

Both ICICI and SI have been active in seminars and conferences, in some cases with direct participation by USAID, as well. ICICI sponsored four seminars on TEST in 1993-94 that were targeted to reach a broad spectrum of potential TEST clients. This tactic appears to have been successful, since the seminars helped to generate much of ICICI's TEST business.[38] Since then, ICICI has frequently made brief presentations at various seminars and conferences and hosted a booth at four different events (one sponsored by USAEP), but has not sponsored additional seminars specifically about TEST. This was a conscious decision, based partly on the uncertainty of USAID funding in the last two years; ICICI and USAID judged that it would be inadvisable to generate increased demand for TEST financing until the funding situation was more certain.

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[36]From ICICI, TEST Programme: Eighteenth Status Report, Appendix 8.

[37]Reasons for closing (i.e., no longer tracking) cases were primarily lack of interest or not eligible for TEST financing.

[38]During this same period, ICICI also sent letters to more than 900 Indian companies about TEST. ICICI identified these companies from the seminars it sponsored, from its existing client base, and from trade associations and other sources.

The interim institutional coordinator for TEST (before SI's contract began) participated in the first ICICI seminar in India, and SI participated once in 1994. The team did not have detailed information about numbers and type of similar SI activities in the United States, but SI appears to have aggressively marketed TEST in the U.S., partly through attendance at seminars and conferences.

4. Research reports

SI has prepared 23 research reports. Reports are estimated to cost $5,000 each. Recipients of this service must pay a percentage of the research cost (10 percent for small companies, 25 percent for large companies)

Recipients of the reports thought the quality was high, and they seemed to make good use of the information. The requirement to pay a percentage of the research cost may have been helpful in attracting participants who were seriously interested.

5. Investment tours and exchanges

TEST alone sponsored four tours to the U.S. for a total of 27 Indian delegates. TEST in collaboration with USAEP sponsored 16 tours to the U.S. for an additional 33 Indian delegates, based on expressions of interest after receiving TEST research reports. Altogether, 33 Indian companies participated in these tours. In addition to investment tours, TEST sponsored nine exchanges for technical assistance.[39] It was not possible to tabulate what percentage of the investment tours or technical assistance exchanges resulted in commercial transactions.

The way that trip financing was shared among TEST, USAEP and project participants varied according to program priorities and budgets. In some cases, participants who were dissatisfied with having to travel by economy class (for reasons of flexibility in scheduling or comfort) paid for their own international fares. As a result, the current rule is that Indian tour delegates pay for their own international travel to the U.S., and USAEP and/or TEST pays for their in-country expenses.

6. Internet web site

So far as the team could determine, the TEST home page consists mostly of basic TEST information and copies of project documents. There was no information about U.S. use of the web site.[40] None of the Indian interviewees was aware of the TEST home page. Few of them have access to Internet, but several expect to have it shortly.

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[39]The evaluation team did not have much information about the technical assistance tours, which brought U.S. technical advisers to India. At least two involved visits to India by U.S. delegations, one on biotechnology and one on hazardous waste management. A third appears to have involved the U.S. company involved with the proposed demonstration project for the Agra Iron Foundry Association (see Appendix 3).

[40]USAID staff responsible for managing it failed to return repeated calls from a researcher in Washington, D.C. who was assisting the evaluation team. According to SI, the USAID web server was not able to track visits to the TEST web site.

ICICI has adequate facilities and staff to develop and operate an Internet information network for TEST. However, their current activities are very heavily oriented toward banking industry needs. There was not sufficient time for the team to evaluate whether ICICI has the appropriate orientation to develop and operate a network geared toward the technological needs of the industrial community to address environmental problems. However, ICICI reports that its plans for developing a TEST web site are well-advanced and will include the use of outside consultants with appropriate environmental expertise.

Ultimately, a more appropriate Indian home base for a TEST web site might be an Indian organization, such as the Federation of Indian Chambers of Commerce and Industry (FICCI) or the Confederation of Indian Industry. TEST, FICCI and ICICI are contemplating a memorandum of understanding to support FICCI's creation of an Environmental Information Center that links TEST, FICCI's Business Information Services Network, and other information sources.

7. TEST library at ICICI

SI has provided ICICI with books, directories, buyers' guides, U.S. Government publications, reports, articles and other materials. These materials are stored in a room that ICICI's TEST Group has designated as the TEST library, which is available to anyone visiting ICICI. ICICI has circulated a bibliography of TEST library materials to its branch offices and to various organizations. It is unclear how much the library is used (by the TEST Group, other ICICI staff, or outsiders) or how useful it has been to those who have visited it.

As with the TEST web site, it seems questionable whether ICICI is the most appropriate Indian base for the central TEST library. To make the library materials more readily available to the business, industrial and engineering communities, it would be useful to explore the possibility of transferring the library to a trade association, or the business or engineering school of an Indian university. It might also be advisable to make some materials available at the library maintained by the U.S. Information Service in Delhi.

G. HOW WELL HAVE ACTIVITIES TO DATE MET THE GOALS OF TEST?

Both ICICI and SI have satisfied their project commitments. Beyond this, it is not possible to assess how well activities to date have met the goals of TEST. This would require a longer time horizon, more complete information, and more detailed analysis of existing information than was possible during this evaluation.

Most of the analysis that would normally be presented in this part of the evaluation report is instead incorporated into Part IV below, on how to modify TEST as the vehicle for CTI/I. However, there are several points that the evaluation team wishes to emphasize here, in addition to commentary in the preceding sections of Part III above and in Part IV below:

1. A major financing component for TEST is no longer appropriate. There is much more financing available for projects that will increase a company's productivity through improvements that offer environmental benefits than was contemplated when designing TEST.

ICICI has cited several factors that it believes support continued TEST financing.[41] Even if all these factors are correct (the team could not assess them), the team still believes that TEST should not retain a major financing component because: TEST technical assistance alone appears to have generated about the same number of commercial transactions as were financed by TEST;[42] every borrower interviewed said that acceptable financing would have been available from other sources (even if not on equally favorable terms); and most technical assistance recipients interviewed did not plan to seek TEST financing for their proposed commercial transactions.

The main benefit of TEST financing appears to have been accelerating some or all of the transactions involved. This possible benefit does not seem great enough to warrant the use of limited project money, especially since the total amount of financing and total number of projects that can be financed is small compared to the total market and potential lines of credit that are available through other sources. Consequently, the team has concluded that any financing component of TEST will be most effective if concentrated on introducing new pollution abatement approaches for older, smaller, economically important industries that are under great pressure to upgrade environmental management, as discussed in Part IV.B.2. below.

2. USAID and ICICI should promptly decide how to handle pending loan applications so as to minimize inconvenience to applicants and problems in program management.

ICICI feels strongly that about $5-6 million should be awarded to loan applications currently in the pipeline, as noted in Part III.E.2. above. This would have major implications for the redesign of TEST because of the amount of money involved, unless this money would come from a source other than projected funds for CTI/I.

3. TEST should place more emphasis on promoting environmental services that can have strong multiplier effects in terms of their environmental impacts.

4. Activities of TEST partners should be coordinated to promote better synergy and leveraging. This will be particularly important given the larger number of players expected for CTI/I.

5. For CTI/I, there should be more focus on how to design performance indicators and how to monitor performance. Reporting requirements should be designed to facilitate these activities, and one party (probably the institutional contractor) should

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[41]Factors cited include: U.S. providers of environmental technologies and services are perceived as more expensive than Asian and European competitors, who are aggressively marketing in India; the financing components helps to "jump start" initial sales of U.S. technologies that have a good potential market but would otherwise have more difficulty with entry into India; the growing demand for environmental services and technologies in India supports continuing a financing component to take fullest advantage of potential opportunities to apply U.S. services and technologies; and the financing component is a very distinctive feature that makes the TEST program stand out.

[42]It was not possible for the team to do any comparison of the commercial transactions financed by TEST and the commercial transactions facilitated by TEST technical assistance but financed from other sources. If USAID is having trouble deciding whether to change the current financing component of TEST, it might be worthwhile to do a brief environmental and market analysis comparing to the two sets of commercial transactions.

be responsible for integrating reports from all TEST partners so that they can provide a comprehensive picture. This effort should involve more thorough tracking and analysis of TEST activities to date.

6. USAID should plan how to minimize potential disruption between the end of Sanders International's contract on January 31, 1997 and the time when a new contract for coordination of technical assistance is awarded. USAID expects to redefine the role of the U.S. institutional contractor for TEST and to award a new contract in early 1997. If there will be a significant delay until this happens, USAID intends to identify a mechanism to enable SI to continue serving in the meantime.

IV. LESSONS LEARNED FROM THE TEST EVALUATION AND IMPLICATIONS FOR CTI/I

A. OVERVIEW OF CTI/I

In response to the Common Agenda for Environment, USAID/India has moved ahead with redesigning TEST as the vehicle for CTI/I, before this mid-term evaluation began. The overarching TEST goal to "assist Indian industries to adopt environmentally sound practices while promoting sustainable linkages between U.S. and Indian firms" is broad enough to encompass all the activities currently proposed for CTI/I.

USAID/India expects to begin implementing the first stages of CTI/I in early 1997, and to extend TEST for an additional five years. This means that CTI/I will run for nearly six years, until a revised PACD of September 30, 2002. The tentative budget for the first two years of CTI/I is about $8 million. $5 million would come from USAID, and $3 million from USAEP. However, one-half of the USAEP money would pay for operating expenses for an expanded USAEP operation in India, with four regional offices, and so there would be a total of about $6.5 million available to spend on CTI/I programs in the first two years.[43]

An Indian institution representing GOI and a U.S. institutional contractor (IC) with a full-time presence in India will have the lead on implementing TEST. Requiring the IC to have a full-time presence in India should enhance monitoring of TEST activities and improve cooperation among participating institutions. This latter point will have increased importance because CTI/I envisions significant supplemental support from other Indian institutions, some of whom will receive funds from the IC on a contract or grant basis to enable them to carry out specific activities to achieve project objectives.

CTI/I as currently planned consists of four main components:

1. Awareness raising (leadership development, analysis and outreach, and partnerships);

2. Private environmental incentives (bench marking industrial environmental performance, national infrastructure for ISO 14000, supply chain management, environmental reporting and disclosure, environmental due diligence for bank loans,[44] and market instruments);

[43]Note that this amount is very close to the estimated additional $5-6 million in loans that ICICI believes should be awarded, even if the modified TEST does not retain a major financing component, as discussed above in Parts III.E. and III.G.2. This underlines the urgency of deciding about possible TEST loans in the pipeline, unless there would be a separate source of money to cover these loans.

[44]Environmental due diligence for bank loans does not appear in the most recent CTI/I documents, but USAID/India says that it will be included CTI/I.

3. Industrial environmental management (industrial extension systems, sector-specific voluntary industry standards, and professional and vocational human resource development); and

4. Technology development, adaptation and transfer (financing, identifying U.S. sources of environmental technologies and services, investment tours, business facilitation, and information networks, including an Internet site).

Thus, TEST as modified for CTI/I will involve a much wider range of activities. The move away from financing as a major component is consistent with the findings of this evaluation, as discussed above. Most or all of TEST's current activities fall within the fourth CTI/I component, which is the least well-defined so far.

Appendix 14 contains a table that reviews all the current and proposed measures to be included in TEST, as well as a few additional ones suggested by the evaluation team. These measures are organized according to the four CTI/I categories noted above. The table includes the following information about each measure:

1. Whether its main focus is general environmental management or a specific target (e.g., industrial sector, geographic region, or environmental problem);

2. Whether the emphasis is on public or private sector or both;

3. Current and proposed status under TEST;

4. The lead implementing institution;

5. Types of performance indicators; and

6. Miscellaneous comments.

B. DISTINGUISHING AMONG MARKETS IN INDIA FOR ENVIRONMENTAL SERVICES AND TECHNOLOGIES

The current design of CTI/I focuses heavily on the first category listed below, new and growing industries. Emphasis on this category seems appropriate, given the CAE's stress on clean technologies and the expected explosion of new industrial growth in India. However, this new growth is just one aspect -- though a very important one -- of a continuum of industries and evolving environmental needs and capabilities. The evaluation team recommends giving more consideration to the other two categories listed below: older, mostly medium- or small-scale industries; and environmental services.

1. New and/or growing, forward-looking industries

The main market using TEST financing and technical assistance seems to have been industries making productivity and competitiveness improvements -- that incidentally have environmental

benefits -- in response to international (and in some cases, domestic) market incentives. Here, the needs are primarily for building awareness, identifying U.S. sources, building information networks, and guidance/support in pursuing partnerships with U.S. companies. In some cases, Indian companies seeking collaboration with U.S. partners might benefit from information about sources of financing, but they do not need special financial arrangements because now there are adequate sources of financing in India for projects that will improve business productivity (along with environmental improvements).

The determining factor in defining this class of industry seems to be management style, rather than sector, size, environmental impact, or geographic location. These are forward-looking companies who see new business opportunities linked to economic liberalization and globalization. Thus, selection of potential clients for this part of TEST should continue to be demand-driven, at least for CTI/I activities that do not require a targeted focus.

2. Older, mostly medium- or small-scale industries

There is growing regulatory and public pressure on older, small- and medium-scale industries to either adopt effective pollution abatement measures or close down. This pressure increasingly takes the form of judicial activism, in response to public interest litigation. Some of these industries are closing down or being phased out, but many are economically important and are likely to continue operating for the foreseeable future.

These industries realize the importance of pollution control, but they often need substantial help with identifying appropriate technologies, services and sources, and with financing. So far, this market has made relatively little use of TEST -- either directly, or indirectly through companies that could provide them with needed services and technologies.

There may be great potential for TEST to provide much-needed help. Technical assistance to carefully targeted sectors and regions could be very productive, in terms of both environmental benefits and commercial opportunities for Indian and U.S. companies. TEST should consider how best to target clustered sectors that have strong incentives to improve, will continue in operation for the foreseeable future, and could substantially reduce environmental harm via low cost, low maintenance technologies or processes available in the United States.

This is an area where limited financing of demonstration projects might prove a valuable complement to technical assistance, if targeted to situations where an individual facility may not be able or willing to obtain the necessary financing for a demonstration, but a successful demonstration could lead to rapid acquisition of the new technology or process by a substantial number of facilities, with a strong multiplier effect. To be eligible for financing, a demonstration project should be designed for implementation (with any needed financing coming from outside of TEST) if the demonstration shows it to be environmentally and commercially viable. The example of TEST's involvement with the Agra foundries illustrates some aspects of this concept.[45]

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[45]The Agra foundries received a promise of U.S. help during finalization of the Indo-U.S. Common Agenda for Environment. Through TEST, the Agra Iron Foundry Association identified a U.S. company with a low-cost, low-

(continued...)

3. Environmental services

Information gathered by the evaluation team indicates that TEST's work has concentrated heavily on technologies (and processes), with little focus on environmental services. This may be partly a result of the emphasis to date on financing, since loans have been for upgrading specific facilities and/or expanding manufacturing and product distribution.

USAID should consider how to increase TEST's support for strengthening environmental services in India. Environmental services such as engineering, redesign, monitoring, analysis, or environmental auditing have potential for quicker and more direct multiplier effects than upgrading technologies or processes at individual facilities. These services could also promote more business for manufacturers and vendors of pollution control equipment, who have been primary targets of TEST to date.

Services focusing on productivity improvements that also generate environmental benefits should have a receptive market among companies trying to become more competitive in domestic and international markets. Services that can advise on locally appropriate means of pollution abatement (including joint treatment facilities) should have a receptive market among older industrial sectors that are under intense regulatory, judicial or public pressure to upgrade or close down. USAID staff at one of the mission briefings noted that another potential market might be services to conduct feasibility studies for infrastructure projects, such as industrial estates, public water supply, and sewage treatment systems.

Yet another type of environmental service that TEST might fruitfully explore further is environmental analysis and monitoring. The main example of this within TEST to date seems to be the technical assistance (research reports and investment tour to the U.S.) provided to the Electronics Corporation of India (ECIL, summarized in Appendix 3), a parastatal company that limits mark-ups on sale of its products to 10-20 percent. ECIL anticipates soon completing two definite and two more potential agreements with different U.S. companies to begin manufacturing instruments for environmental monitoring and analysis for air, water and chromatography. Other companies interviewed also mentioned a perceived need for better equipment and services for environmental monitoring.

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[45](...continued)
maintenance air pollution control technology that seems well-suited (the technology could potentially help any coal-burning facility, not just foundries). TEST has been helping with arrangements for a demonstration unit, but there have been problems with identifying an appropriate TEST financing mechanism, and with negotiations between the U.S. supplier and its preferred Indian partner company. (For more information, see the interview summaries on Agra Foundries, Agra Pedicabs and MIL Industries in Appendix 3.)

In the course of this mid-term evaluation of TEST, USAID learned that Agra is probably not going to be a suitable demonstration site because all Agra industries may be required to switch their fuel from coal to natural gas very soon, as the result of a citizens' lawsuit. However, the possible closure of all foundries in Agra is a special case linked to the Taj Mahal. Thus, there appears to be good potential for TEST to support a demonstration of the U.S. technology in a more suitable location, such as Hourali (West Bengal) or Golindpur (Panjab).

In some cases, it may be possible to integrate TEST assistance on environmental services with related activities supported by the U.S. or other donors. For example: (1) environmental monitoring could be linked to support for regulatory activities sponsored by USAID or other donors, such as the World Bank; (2) environmental monitoring could be designed to help with monitoring long-term impacts of some TEST-sponsored activities; (3) there may be a need to develop licensing procedures or other means of standardization for various types of environmental services; (4) some environmental services, such as assistance with feasibility studies, could also have benefits for the urban and/or energy components of CTI.

C. TARGETING PROJECT ACTIVITIES

Activities under TEST have been demand driven. Some activities under CTI/I may continue to be demand driven, but USAID/India intends for CTI/I to be more targeted in its focus, where this will increase impact, improve the ability to evaluate performance, and/or will be required by the nature of the activity (e.g., industry-specific voluntary standards).

One general institutional question is whether to use the same target(s) for more multiple CTI/I measures or to use different targets for different measures. Probably at least some sustained targeting through different measures would be helpful, both for simplified administration and potential impacts, but this is a question the evaluation team cannot address in detail.

A more general question is how to decide which industrial sectors, geographic regions, (many industrial sectors tend to be clustered geographically) or environmental problems to target, where targeting is appropriate. To some extent targeting will have to be opportunistic,[46] but CTI/I proposes to use the early awareness raising activities as a key means of targeting other measures. This should be a helpful tool, but CTI/I should also make use of the experience and data developed under TEST and USAEP's activities so far. The evaluation team recommends analyzing existing TEST and USAEP activities and data (as well as from any other available sources) to identify any significant trends regarding: industrial sector; type of technology or service; environmental management approach;[47] geographic location; and environmental media or problem. One trend that seemed to emerge from the evaluation team's site visits was an emphasis on controlling particulate emissions.

Another type of targeting would be to look for possible synergy with other programs. The preceding discussion of environmental services noted some possible links of this type. Others might include: focusing application of marketing instruments on user fees for landfills (for links with CTI/urban); or coordinating with other donors for CTI/I activities in areas where they are contributing substantial environmental support (e.g., protection of the Taj Mahal in Agra, or informing TEST participants about multilateral sources of environmental financing).

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[46]For example, USAEP recently learned that trade leads they passed on to the U.S. have led to three U.S. companies appearing on the "short list" to be awarded a contract to build-own-operate joint wastewater treatment systems on five chemical industrial estates. If these bids are successful, USAEP intends to refer the U.S. companies to TEST for more in-depth assistance.

[47]At a minimum, determine whether a given project involved pollution abatement (end-of-pipe control) or pollution prevention. There could be further refinements within each of these two broad categories.

Finally, information exchange is an important potential focus and benefit of targeting some TEST activities. In addition to promoting stronger information networks under CTI/I, TEST should look for opportunities to disseminate information to targeted sectors about relevant information developed during this first phase of TEST, including information about successful projects that received TEST financing.

D. STRENGTHENING AND EXPANDING TEST'S PARTNERSHIPS

TEST as modified for CTI/I would benefit from re-evaluating, broadening and strengthening its partnerships, especially with respect to the categories listed below.

1. USAEP

TEST and USAEP/India both began operating in mid-1993 or a bit earlier. Early confusion (and perhaps some competition) about distinguishing between program roles has given way to fairly good cooperation, especially when arranging investment tours and exchanges. The mechanisms for organizing and funding these trips have shifted over time, partly as a result of changing program resources.

It is going to be important to clarify and strengthen collaboration between TEST and USAEP to ensure maximum effectiveness of CTI/I. As noted above, USAEP may contribute approximately one-fourth of CTI/I funds in the first two years, excluding the cost of USAEP administration in India. Also, USAEP is expanding its India operations, with a Director based in Delhi overseeing four regional offices. The presence of a full-time USAEP representative in Delhi has already facilitated coordination among TEST, USAEP and USFCS.

CTI/I envisions USAEP's role as falling primarily in the fourth component, Technology Development, Adaptation and Transfer. The most obvious links are USAEP's circulation of trade leads and support for investment tours and exchanges. However, there will probably be substantial possibilities beyond this (both for CTI/I and other component of the Common Agenda for Environment), depending partly on how USAEP's expanded India operation evolves, and whether USAEP continues to be entirely demand driven or also envisions some more targeted focus.

Factors to consider in clarifying and harmonizing the roles of TEST and USAEP include:

1. Where are the closest links in priorities?

The clearest fit is in ISO 14000, an important CTI/I measure and one of USAEP's top five priorities in its 1996 business plan. The fit is more general and/or less clear with the other four top priorities in USAEP's business plan: water/wastewater treatment/air pollution control (this probably correlates to pollution abatement and related services); pollution prevention (this correlates most strongly to new and growing industries); solid waste management (this may have a better fit with CTI/urban than CTI/I); and aquaculture (it is not clear what correlation this might have with CTI).

USAEP will no doubt refine and revise its priorities for India as its four regional units become operational. This process and the information gathered should also be very helpful to TEST.

2. How to clarify roles and responsibilities between TEST and USAEP, and how to communicate their respective roles and responsibilities to others?

The fluid and flexible nature of both CTI/I and USAEP may prevent firm delineations at all times. At a minimum, though, it should be clear what use will be made of USAEP funds contributed to CTI/I and to what extent other USAEP activities are available for coordination with CTI/I. Also, the two programs should set joint targets and maintain shared databases for activities supported by both, such as investment and awareness raising tours, to minimize confusion and avoid "double-counting." Coordination should be helped by the weekly meetings now held between TEST and USAEP in Delhi.

All personnel in both programs should clearly understand their respective roles and in what situations it may be appropriate to make a referral to the other program. Brochures should reference each other's services and clarify how they fit; for example, brochures should explain the difference between the USAEP trade leads services and the fee-based, confidential technology research reports available from TEST (assuming the latter are continued).[48]

3. How to share/coordinate data, regarding both program activities and program performance?

Right now, it appears that USAEP, ICICI and SI all use different sources of information about trade leads and other relevant issues. The creation of new and more extensive information networks (Internet and other formats) should take into account ways of integrating information from these sources and other U.S. and Indian institutions. Another point is how to coordinate and analyze information that can help with program evaluation and modification.

USAEP staff noted that they have not had adequate resources for close program monitoring since 1994, but presumably that will change with their expanded India operation. To what extent would it be possible for TEST and USAEP to share monitoring activities in India?[49]

2. Other U.S. Government programs

The evaluation team was not able to consider actual or potential TEST coordination with U.S. Government (USG) programs other than USAEP, except for some activities with the U.S.

[48]Another point to be clarified is the fact that recipients of TEST services may participate more than once; several interviewees did not realize that they could ask TEST for research reports or loans for more than one proposed project.

[49]For example, USAEP's Washington office is instituting a new region-wide "due diligence" tracking system to monitor program activities. If this systems seems to be working well, it might be useful to incorporate TEST activities for India, or at least set up a parallel TEST tracking system that would be compatible for purposes of monitoring both USAEP and TEST activities in India.

Environmental Protection Agency under the Common Agenda for Environment.[50] Overall CTI/I-USG collaboration will require more study.[51]

3. Indian institutions

ICICI has been the only Indian institution to play a significant role in TEST. This will change with CTI/I, which envisions partnerships with a variety of institutions to help implement different measures and to forge links for the information network.

ICICI may continue to be the most appropriate GOI representative to TEST. However, given ICICI's primary function as a bank, this needs to be clarified since TEST as reconfigured will probably have at most a very limited financing component for demonstration projects. Questions to be considered include:

1. Whether TEST as reconfigured is consistent with ICICI's priorities;

2. Whether ICICI would be an appropriate agency to manage small conditional grants for demonstration projects, or whether this would be better housed at an institution specializing in small- and medium-scale financing, such as the Small Industry Development Bank of India (see SIDBI interview summary in Appendix 3);

3. If ICICI continues as the GOI representative to TEST:

    a. Should ICICI continue to maintain a separate TEST Group within its Technology Products & Services Division?;

    b. What role, if any, might be appropriate for ICICI's new Advisory Services Division?;

    c. Will ICICI be the most appropriate primary base for the TEST library and TEST Internet web site?; and

    d. How can ICICI most effectively advise TEST on providing information to program participants about sources of financing?

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[50]EPA helped TEST to identify the U.S. institute that conducted a study of the Agra pedi-cabs (see Appendix _). USAID/India and EPA are planning a conference in February 1997 for national and state policy makers and industry on reinventing regulation (based on EPA's Common Sense Initiative for regulatory flexibility with accountability).

[51]This report suggests placing at least some TEST library materials in the USIS library (see Part III.F.7. above). USAID should consider whether to help USIS develop an environmental section for its library (or expand one that may already exist) as part of the Common Agenda for Environment.

The Indian institutions likely to be new partners of TEST are mostly trade associations and research institutes.[52] Another group of potential partners is central and local government regulatory agencies (for environment, industry, or pollution control boards). At a minimum, their approval may be necessary or helpful for carrying out special projects within their jurisdiction, such as assisting older industries to satisfy regulatory and judicial requirements. Closer working relationships would be required for any TEST activities with a direct regulatory focus. Here, it would be important to work with agencies that have a strong interest and commitment to collaboration with TEST.[53]

4. International donors

TEST's main interaction with other international donors has been two collaborations with the World Bank[54] and limited consultation with the Asian Development Bank.[55] There may also be some opportunities to involve TEST in broader environmental consultations that USAID is having with other donors.[56] Appendix 3 summarizes meetings with the Asian Development Bank and World Bank. Appendix 5 summarizes information about relevant environmental assistance programs of other donors.

It may be advisable to increase consultation with other donors, particularly regarding:

1. Strategic consultation to coordinate on related program targets.

If TEST pursues activities in Agra, or any other location (or sector) where there is already strong interest from other donors, it would make sense to consult before proceeding too far with program design, both to ensure a good fit and to clarify whether there will be adequate support, if needed,

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[52]E.g., the Federation of Indian Chambers of Commerce and Industry, the Confederation of Indian Industry, the National Productivity Council, and the Council for Scientific and Industrial Research (see interview summaries of the first three organizations in Appendix 3).

[53]For example, The Agra and ECIL trip reports note potential problems in trying to work closely with the government of Uttar Pradesh.

[54]The World Bank agreed to consider funding a hazardous waste management project for an industrial area in Ankleshwar, based on a feasibility study to be conducted with support from TEST. The feasibility study is finished, and the appropriate government authorities and the World Bank are now discussing a follow-on project.

The second proposed collaboration was with regard to the demonstration project with the Agra Iron Foundry Association (see Appendix 3). Originally, USAID was going to pay 30% of the cost and the World Bank was going to pay 70%. However, when the demonstration cost was finally estimated to be only $100,000, USAID and the World Bank agreed that TEST would cover the entire
cost.

[55]USAID and the ADB agreed to consult about activities in Agra, where ADB intends to finance about $150 million for a broad range of environmental improvements. However, ADB suggested postponing these discussions until it has finalized its plan for Agra.

[56]For example, USAID and UNDP are now discussing a number of potential joint environmental activities, some of which could involve industry.

from local governments that may view the TEST assistance as rather insignificant when compared to assistance from other donors (this could be a concern regarding Agra).

2. Financing.

Other donors, most notably the World Bank, are already providing much larger environmental lines of credit than TEST ever did -- and far more than would be contemplated in limited TEST funding for demonstration projects. TEST will need to find out more about these programs if it is going to provide information to participants about possible sources of financing for Indo-U.S. commercial transactions.[57]

3. Potential cross-overs between TEST and programs of other donors and/or foreign competitors of U.S. environmental technologies and services.

ICICI's TEST Group mentioned during the evaluation meetings that other bilateral and multilateral donors (e.g., Canada, European Union, Nordic Fund) have expressed interest in the TEST concept of matching U.S. technologies and services with Indian environmental needs in a commercial context. So far, this approach appears to be unique to USAID, but there is always the possibility that other donors could take a similar approach. This could generate more competition for U.S. participants in TEST.

Another way that increased foreign competition might arise is through TEST's information networks. It seems unlikely that Indian institutional partners of TEST could or would restrict information to focus only on U.S.-based sources of environmental technologies and services. Another complicating factor is that it may be difficult sometimes to define a "U.S." company. The evaluation team encountered one example where a U.S. company asked its UK division to deal with the potential Indian partner, and another where the U.S. company was sold to an international company based elsewhere.

5. Industries and institutions using TEST services

USAID should consider whether there might be suitable ways to involve TEST participants in larger efforts to: (1) generate more knowledge about promising activities and thus increase the multiplier effect of TEST and (2) improve short- and long-term monitoring of TEST impacts. For example, perhaps it would be possible to arrange for visits from other interested companies to see innovations that are not trade secrets (this should be a requirement for any demonstration projects financed by TEST), to arrange for TEST participants to speak at organized events, or to obtain cooperation in collecting information to monitor TEST performance. Some of these activities might fit within proposed CTI/I components for raising awareness and strengthening industrial extension systems.

[57]There was little information available about the U.S. share of the Indian environmental market; TEST should consider ways of gathering more information (in coordination with USAEP and USFCS). ICICI indicated that some percentage of the financing that it manages from World Bank environmental lines of credit goes to U.S. firms.

E. IMPROVING PROJECT INDICATORS AND PERFORMANCE MONITORING

The evaluation found that monitoring of TEST activities was one of the weakest aspects of performance. This is not surprising, given the lack of a full-time IC representative in India and limits on the possibility of requiring TEST borrowers to carry out and report on long-term monitoring.

More thorough and more long-term tracking of TEST activities could greatly improve both project design and evaluation. Modification of TEST for CTI/I(including full-time IC representation in India) offers an opportunity to improve project monitoring, which would help to identify better performance indicators and evaluate how well they have been achieved.[58] The evaluation team recommends that this issue receive strong emphasis in the redesign of TEST.

Key considerations include:

1. As USAID already recognizes, Strategic Objective 5 in its Mission Results Framework (improved air and water quality at selected industrial sites and municipalities) needs to be re-evaluated in light of CTI.

USAID is already far along in rethinking organization of its strategic objectives for environment. The evaluation team has provided informal comments, but it would be premature to make a formal assessment now.

2. Performance indicators and the structure of performance monitoring should reflect the need for longer time horizons to evaluate project impacts.

Just as in TEST's original design, many of the new activities that CTI/I is intended to foster will require substantial time to generate results with meaningful quantitative or qualitative impacts[59] -- and will also require substantial commitment of time and resources to measure and evaluate these impacts. As noted above, it should be possible to make more use of existing data from TEST and USAEP to help evaluate trends and impacts and begin developing performance indicators better tailored to the nature of TEST.

Despite the need for more long-term monitoring, TEST will also have to respond to USAID's short-term monitoring and reporting requirements. Thus, it may be necessary to continue targeting numbers, much as has happened under current TEST reporting: number of organizations assisted; number of tours; volume of sales; etc. The potential arbitrariness of this approach could be somewhat alleviated by evaluating relevant TEST and USAEP experiences to date.

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[58]The most thorough discussion of possible CTI/I performance indicators that the team encountered appears in Owen Cylke, Larry Lai, John Mapes, Common Agenda for the Environment, Clean Technologies Initiative/Industry Strategic Framework, memorandum submitted to USAID/India (September 23, 1996).

[59]In addition to sustainable commercial transactions (discussed in Part III), this is also typical of building information networks (especially in a format such as Internet that is very recent in India), and new programs such as voluntary sectoral standards or market instruments.

3. It is important to maximize learning from the initial three-plus years of TEST.

CTI/I will greatly broaden TEST activities and largely reduce the financing aspects that were central to TEST's initial phase. This shift is clearly justified by evolution of the factors underlying the original assumptions of TEST and subsequent developments, including the Clean Technology Initiative. Nevertheless, USAID and its partners invested substantial resources (human, financial and time) in TEST as originally conceived and it is still too early to gather many of the potential lessons from this phase of activity.

4. Another point to consider is whether to phase in new CTI/I activities incrementally.

The current CTI/I budget planning is for the next two years, but there will be nearly six years for TEST as modified to operate. Since the expanded range of measures for TEST seems quite ambitious, and there will be many more institutional partners and activities to coordinate, USAID should consider how to phase them in most effectively. To some extent, program phasing could be linked to development and use of performance indicators.

5. Special commercial services to TEST participants should become self-supporting or else should be evaluated to determine whether the extra program costs are justified by resulting environmental and economic benefits.

There is no doubt that the technology research reports and commercial facilitation services of TEST have accelerated the speed of commercial transactions (as has TEST financing, in some cases) and probably led to some Indo-U.S. partnerships that would not have occurred otherwise. However, there is no ready way to evaluate whether these benefits are great enough to warrant the amount of USAID resources invested.

6. USAID should structure reporting requirements for TEST to facilitate project monitoring and evaluation.

Good management of the TEST reporting system will become increasingly important and increasingly challenging as the variety of TEST measures and the number of institutional partners increases. There should be standardized formats and terminology for reporting of key information. One partner (possibly the institutional contractor) should be responsible for oversight and management of reported information,[60] including (1) integration and analysis of information from all TEST partners, as appropriate; and (2) periodic evaluation of the reporting system to evaluate whether it is adequately meeting project needs.

[60]TEST should consider having its institutional partners submit standardized reports to the institutional contractor via the Internet. This would be an administrative benefit of enhancing use of Internet networks in the TEST program.

7. In light of the above considerations, USAID should consider making tracking and analysis of TEST performance itself a performance indicator, at least for the next 2-3 years.

This step would institutionalize monitoring and analysis of TEST performance, thus helping to ensure adequate feedback for purposes of project evaluation and adjustments to project design.

V. CONCLUSION

The Executive Summary highlights the most critical of the teams' findings and recommendations that are presented above. The first phase of TEST occurred during a time of rapid change in India's environmental market. The most important driving forces appear to be economic liberalization and globalization (for pollution prevention) and judicial activism linked to citizens' lawsuits (for upgrading of older facilities). USAID's plans to redesign TEST for CTI/I are consistent with the results of this evaluation. Overall, the most crucial "lesson learned" for CTI/I may be the need to strengthen design, monitoring and reporting for project indicators, which will in turn enhance evaluation and feedback for ongoing project improvement. This is particularly important since TEST is intended as a "cutting edge" project, with potential as a catalyst for other U.S. Government programs and other international donors.

Appendix 1

BIBLIOGRAPHY

BIBLIOGRAPHY

Confederation of Indian Industry, Environment Management Division, New Delhi, Environmental Management and Business Opportunities in India, prepared for Sanders International under the TEST Project (October 1995).

Owen Cylke, Larry Lai, John Mapes, Common Agenda for the Environment, Clean Technologies Initiative/Industry Strategic Framework, memorandum submitted to USAID/India (September 23, 1996).

ICICI, TEST Programme, EIGHTEENTH STATUS REPORT As on October 31, 1996

ICICI, TEST Brochure, 1994.

ICICI, TEST PROGRAMME, List of Applications Rejected, 11/21/96.

ICICI, "Possible Business Opportunities in the Paper Industry" , Internal Memo, August 2, 1996.

ICICI, Summary Statement of Host Country Contributions As On 31/03/95, Attachment A.

JPS Associates, Management Consultants, New Delhi, Analysis of Financial Sources for Environmental Technologies/Services prepared for USAID (September 1996).

Ministry of Environment and Forests, Government of India, New Delhi, Annual Report: 1994-95.

Sanders International, Spread Sheet on TEST Technical Assistance Cases and Annexes for Level of Effort 5 Cases, TEST Cases Spreadsheet and Memorandum, November 7, 1996.

Sanders International, TEST Status Report - October 1996

Tropical Research & Development, Inc., Nathan Associates, Inc. and Groundwater Technology, Inc., Market Survey of Proposed Trade in Environmental Services and Technology Project in India, prepared for USAID (November 1991).

Tyagi,Paritosh C., Interlinking the External Assistance in Environmental Assistance Sector in India, prepared for the Ministry of Environment and Forest, Government of India for assignment funded by the World Health Organisation (January 1993).

United Nations Development Programme, New Delhi, Development Cooperation: India, 1994 Report (November 1995).

United Nations Development Programme, New Delhi, India's External Development Partners: Profiles of Cooperation Programmes (September 1996).

USAEP, Country Assessment: Republic of India, September 30, 1996.

USAEP, Clean Technology: An Integrated Approach to Environmental Management of Industrial Development, June 1996.

USAEP, Results Management Plan, October 1996.

USAID, A.I.D. Project No. 386-0530 Project Grant Agreement Between ICICI and the United States of America for TEST, September 30,1992

USAID, INDIA: Results Review and Resource Request (R4) (April 1996).

USAID, Project Implementation Letter, Project 386-0530, March 2, 1996.

USAID, Project Paper, India, TEST 386-0530, September 21, 1992

USAID, Quarterly Project Financial Management Report (September 30, 1996).

USAID, TEST (386-0530) Control Subledger Document, November 12, 1996.

USAID, TEST Evaluation Delivery Order Statement of Work, Attachment B, September 1992.

USAID, TEST Project Agreement, September 30, 1992, Section J-3.

USAID/India, TEST Revised Logical Framework Matrix (1/30/95).

USAID, New Delhi, USAID/India: Programme Summary (October 1995).

USDOC, Market Research Report, India - Environmental Progress - IMI960201, August 26, 1996.

USDOC, Market Research Report, World - Pollution Control Equipment - BMR9403, August 26, 1996.

Appendix 2

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PEOPLE INTERVIEWED FOR THE TEST MID-TERM EVALUATION

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Appendix 3

SUMMARIES OF INTERVIEWS

AGRA IRON FOUNDERS ASSOCIATION (AIFA)
(see also, notes on Agra pedi-cabs and MIL Industries)

Background. There are about 200 foundries in Agra. Most are clustered in one area, though others are scattered. They are small, family-owned businesses, many started more than a generation ago. The foundries use coal as their fuel. They have been under great pressure to reduce sulfur dioxide emissions, which are contributing to deterioration of the Taj Mahal. About two years ago, all Agra foundries either installed wet scrubbers or shut down, in response to a court order. The scrubbers have had only limited success because of problems with operation and maintenance: water supply is limited; the water causes rust; and electricity to operate the scrubber is expensive.

It appears likely that all Agra industries, including the foundries, will soon be ordered to switch their fuel from coal to natural gas as the result of a judicial ruling handed down a few months ago in a citizens' lawsuit.[1] AIFA has done some research on use of natural gas as a fuel for foundries. The only examples it has found are in the UK and Germany, and the foundries there operate on a far larger scale than the ones in Agra. During the evaluation visit, some informal discussions indicated that many of the younger generation in the families with foundries have begun diversifying into other businesses because they see a limited future for the foundries in Agra, given the growing concern about protecting the Taj Mahal.

TEST activities. In April 1995, during a visit from the U.S. Secretary of State to sign the Indo-U.S. Common Agenda for

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[1]An environmental NGO has filed lawsuits charging multiple environmental violations concerning urban management in many of India's cities. The Agra case is one of the most advanced. (The Taj Mahal, located in Agra, is a designated UNESCO natural heritage site.) The court found in favor of the plaintiffs in the industrial component of the Agra case several months ago, but has not yet ordered a specific remedy. However, the court has ordered the Indian natural gas parastatal to make natural gas supplies available to Agra. The infrastructure should be completed in early 1997 and the foundries expect that the court will then order all local industries to switch to natural gas.

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Environment, USAID agreed to assist the AIFA to find improved air pollution control technology. TEST thought the concentration of foundries, along with the concern about the Taj Mahal, made this an appropriate demonstration site for improved foundry technology which could be applied elsewhere in India, if successful.

AIFA responded positively and SI arranged for a delegation to visit the U.S. The delegation identified a technology manufactured by EPR as the most promising technology. EPR then visited Agra and selected a potential test site. (EPR would like to collaborate with MIL Industries.) AIFA sent a sample of ash from that foundry to EPR for testing six months ago, and is still awaiting a response. (According to A. Ray, EPR tested the ash a while ago and found it suitable for their technology.)

The appropriate mechanism for financing the test of the new technology has been unclear. About $100,000 would be needed. AIFA is not a suitable candidate for a grant, which is supposed to be made to trade associations, and it is unlikely that the foundry proposed for a demonstration site would qualify for a loan or conditional grant, or would be willing to apply for one.

TEST has had no direct contact with AIFA for several months. During the evaluation team's visit, USAID learned for the first time about the imminent switch to natural gas as a fuel, which would eliminate the need for EPR's technology in Agra. Apparently, AIFA did not inform any of the TEST partners about the pending fuel switch partly because AIFA was hoping that if the test of the EPR scrubber technology was successful, USAID would be willing to ask the court to grant an exemption for the foundries so that they could continue using coal as their fuel.

USAID has received a request for assistance from a foundry in Calcutta, which could be evaluated as an alternative test site.

Issues. This is an unusual case where the TEST program specially targeted a specific industrial sector, in a specific location, and chose to work primarily through an industry association. The case raises several issues:

1. TEST had no ready means of monitoring the situation in Agra that could provide current information about the pending switch to natural gas. In the larger picture, it

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appears that more thorough investigation of the situation in Agra a year ago might have led to a conclusion that it is not a good demonstration site for control of foundry emissions because foundries are going to be phased out, due to concern about the Taj Mahal.

2. Does TEST now have a financing mechanism appropriate to a demonstration of pollution abatement technology at a very small scale industry with many members in the local sector? If not, should one be developed?

3. Why was there an apparent break in communication about testing of the Agra foundry ash sample? Is there a problem in the communication process that needs to be addressed?

4. Has TEST discussed this possible project with other donors also involved in Agra? If so, what was the response? If not, why not, and did they plan to confer at some point?

AGRA PEDI-CABS

(see also, write-up on Agra Iron Founders Association)

Background. Cycle rickshaws, or "pedi-cabs" provide useful services to businesses and families in many cities and are an important source of income. Basic design has not altered significantly since the pedi-cabs were introduced decades ago. There are several Indian manufacturers of pedi-cabs, the largest being Hero in Ludhiana.

In Agra, pedi-cabs are used both for daily transport and commerce. They could also be a good candidate for tourism, since there are plans to help protect the Taj Mahal by banning motor vehicle traffic within a radius of about 4 km. In the U.S. and Europe, pedi-cabs are becoming more popular in congested urban areas, particularly for tourism. There are plans to introduce increased use of pedi-cabs in 35 U.S. cities; 12 of the cities have already begun.

TEST. When TEST began considering possible support to Agra as part of its response to the Common Agenda for Environment, it seemed that Agra might be a promising site for trying to introduce an improved design of pedi-cab for two markets -- local users and tourists. TEST discussed this with local officials and arranged for a visit and study by a U.S. institute (identified with assistance from USEPA) that is familiar with the issue.

During the TEST evaluation team's visit to Agra, the TEST project officer, accompanied by a member of the evaluation team, met with the Commissioner of Agra Division (roughly equivalent to a county commissioner in the U.S.) to discuss the status of this possible project.

The Commissioner's response was lukewarm. He pointed out that the Asian Development Bank and the World Bank are planning to invest large sums (about $1.5 billion and many millions, respectively) on improving environmental management in Agra, and that the assistance being offered by USAID was rather insignificant in comparison. He also expressed a preference for battery-powered pedi-cycles, rather than ones powered by the driver himself, though he acknowledged that battery-powered cycles may not be commercially viable. The Commissioner agreed that this might be a useful project and said that he would ask

the Ministry of Environment and Forests to consider a proposal based on the U.S. institute's study of Agra.

Issues. The proposed Agra pedi-cycle project would fall under the Clean Cities component of the Clean Technology Initiative, rather than the Industry component, but there are some useful issues for TEST.

1. Has TEST discussed this possible project with other donors also involved in Agra? If so, what was the response? If not, why not, and at what point would consultation be advisable?

2. Agra is appealing with respect to growing concern about the Taj Mahal. On the other hand, local government does not appear to be very supportive. Does it make sense for TEST to proceed where there is limited support from local government? Is government support merely a formality necessary to enable TEST to proceed with the private sector, or is it important to project success? If the latter, would it be better to try to identify another locality where the government would be more enthusiastic and so more likely to help make the project a success?

AGRO PULPING MACHINERY LTD.

(see also, write-up on Shreyans Industries)

Background. Agro Pulping Machinery Limited is part of the Chellam group of marketing and consultancy companies and is a manufacturer and installer of equipment to the pulp and paper industries that make use of agricultural waste products. Agro Pulping is the Indian representative of Enders Process Equipment Corporation. They were responsible for installing the Enders process equipment at the Shreyans Paper plant in Ludhiana to convert the black liquor waste effluent into saleable sodium carbonate.

TEST Activities. Agro Pulping first became aware of the TEST Project loan program in August 1993 from a notice in the newspaper regarding a TEST Project seminar. Agro Pulping was aware of the black liquor disposal problem at Shreyans Paper and convinced Shreyans to undertake a demonstration project using the Enders Process technology, with funding from the TEST Project. The Shreyans TEST Project loan was sanctioned in June 1994. Agro Pulping and Enders benefitted from the TEST Project since they were employed to make and install the equipment.

Agro Pulping to date have not used any of the other TEST Project services.

Issues.

1. The TEST Project was not responsible for bringing together an American firm with an Indian firm since the partnership between Enders and Agro Pulping already existed. However, according to Sanders International, TEST involvement was key to developing the project between Agro Pulping and Shreyans (this information did not come out during the evaluation team's interview with Agro Pulping). Also, TEST financing provided the leverage that Agro Pulping needed to convince Shreyans Paper to go ahead with the project sooner than it would have otherwise.

2. How could TEST work more with engineering firms and other environmental service companies that can in turn help their industrial clients to improve environmental management?

3. How can TEST improve information dissemination about successful activities that it supports, such as the Shreyans experience?

ASIAN DEVELOPMENT BANK (ADB)

Background. Asian Development Bank is a regional development bank active in its member countries among the developing countries of south-east Asia. ADB's environment strategy supports the use of environment friendly resources and renewable energy, prevention and control of industrial pollution and improvement of urban environment.

In the environmental sector in India, ADB has proposed technical assistance for coal beneficiation, environmental improvement and sustainable development in the Taj trapezium (Agra-Mathura region), management of toxic and hazardous wastes near Manali Industrial Area in Tamil Nadu and training in environmental impact assessment. So far, the technical assistance agreement has been signed only for the coal beneficiation project.

After a market survey, the Industrial Energy Efficiency Project ($ 150 million) was taken up for implementation in July 1995. The project has some bearing on environmental improvement as the beneficiaries are required to prepare initial environmental examination or environmental impact assessment, as needed. Funding is made through the Industrial Development Bank of India. Repayment is to be made in five years after a period of one to two years of moratorium. Rate of interest has varied from 15.5 and 17.5 per cent per annum. Examples of sub-projects taken up so far include cogeneration of power using bagasse as fuel, energy conservation in a sugar factory and chemical recovery in a paper mill. Interestingly, import of even a second hand plant has been included for a cogeneration sub-project.

TEST Activities. ADB has not participated in the TEST project.

Issues.

The response of the Government of India is awaited for signing the technical assistance agreements in a number of cases. As the projects for technical assistance are carried out mainly through grants from ADB, a possible reason for such lukewarm attitude on the part of the Government of India is the high rates of interest on which funds are likely to be available under the projects that may be formulated through the proposed technical assistance.

ADB has not carried out any survey in the market for environmental services and technologies. ADB does not appear to have made use of internet facilities for sourcing of technologies. The TEST project may gain from informing ADB and enhancing its activities. Also, TEST should monitor whether any CTI/I (or CTI/Energy) activities as they develop might be linked to proposed ADB activities noted above, and if so, consult with ADB.

BIOTECH CONSORTIUM INDIA LTD. (BCIL)

Background. BCIL was established to facilitate commercialization of biotechnologies through technology development and transfer, consultancy, locating funding, dissemination of information and training. It is by the GOI but receives no direct government funding. Funding has been provided by the All India Financial Institutions, including ICICI and IDBI, and a number of corporations.

TEST Activities. During the evaluation interview, BCIL only mentioned its involvement with TEST under contract to Sanders International to assist in putting together the TEST brochure which outlines the activities of the TEST Project. However, Sanders International subsequently reported that BCIL also received a contract from TEST to coordinate the 1995 visit of a biotreatment delegation.

They have subsequently attempted to find a way of working in the TEST Project, on a fee basis, by helping to locate companies in the biotechnology field who may be appropriate candidates for TEST Project funding. They have submitted a proposal for a grant of $100,000 to ICICI to work with Industrial EcoSystems (IES) and Oil and Natural Gas Corporation to locate an Indian firm to demonstrate the IES technology for bioremediation of petroleum contaminated soils.

Issues. BCIL is a quasi government firm looking for assignments as a facilitator to bring together US biotechnology firms with Indian firms to demonstrate that US biotechnology can be applicable to Indian needs if properly introduced. Should money under the TEST Project be made available to facilitators to facilitate transfer of environmental technologies from the US?

CONFEDERATION OF INDIAN INDUSTRY (CII)

Background. Business for environmental services and technologies (EST) is increasing fast. It is estimated that growth in this sector is of the order of 20 to 25 per cent per annum. So far, no more than 40 per cent of the needed investment of about US $ 3 billion has been invested in India in ESTs.

All nationalised banks in India are now involved in funding environmental components of industrial projects. The Bank of Baroda has signed the Green Charter of Banks. The State Bank of India has a wing devoted to support efficient and environment friendly technologies. Major financial institutions have established environmental cells or units within their organisations or they avail consultant services for specific purposes in environmental matters.

TEST Activities. The Confederation of Indian Industry (CII) has functioned as a catalyst to promote the TEST project. CII collected and gave information, issued circular letters and provided specific advice to its members regarding TEST.

CII has not sought any grant from USAID. (According to Sanders International, CII received funds from TEST to conduct an environmental market study; this was not mentioned during the CII evaluation interview.) CII adopts a project- oriented reimbursement approach. CII has proposed a project for obtaining USAID support for spreading awareness regarding ISO 14000 related to environment management systems.

Issues. In the absence of rating and recognition of environmental management consultants, the quality of their service tends to be uncertain. CII has suggested the criteria for the recognition of consultant organisations. CII believes that though there has been some enhancement in the capacity of the consulting services, they are lagging in relation to what is required.

It appears to CII that the impact of TEST is not particularly visible. Compared with the expectations, the relevance and effectiveness of TEST seem quite limited in extent. Installations under the TEST project have in many cases remained isolated and so far, without multiplier effects. Awareness about

the TEST project and the activities carried out under it must be increased through effective modes and active agencies.

It appears that there is a need for stronger orientation towards partnership than has been achieved so far. For venture firms, the approach has to be particularly flexible.

In order to have an impact on a wider range and most appropriate kind of industrial sectors, it is necessary to assign priorities to various sectors. Industrial sectors that seem to deserve priority may be among the following:

- heavily polluting industries, such as distillery, tannery and pulp & paper;
- industries involved in export of goods, such as textiles, dyes and dye intermediates, processed foods and certain chemicals and machinery, and
- industries having the potential of prevention, utilisation or recycling of wastes, such as thermal power plants, cement factories and sugar mills.
- industries producing hazardous wastes, such as those manufacturing pesticides, chlorine and alkali, and certain drugs and chemicals.

Cleaner technologies that may be particularly notable are yet to be included in TEST project. The highest priority should be assigned to technologies that ensure conservation of energy, water and raw materials.

Instrument and equipment for air pollution control seem to have received adequate attention. Same kind of attention should be given to instruments and equipment for control of pollution of water and soil. Control of noise, likewise, is also in need of more attention.

DI FILTERS

Background. DI manufactures air filters for gas turbines as the result of a 1993-94 joint venture with Donaldson, a U.S. firm. (DI's Indian partner had been serving as Donaldson's India rep for about 10 years.) Donaldson owns 51% of the company.

Filters are manufactured with equipment imported from the U.S., with quality control/oversight by Donaldson. Filter paper comes from the U.S. The U.S. is seen as a leader in filters for turbine engines, the closest competition is from Germany. Customers are not interested in the environmental effects of the filters; they want them to maintain operational efficiency of the turbines.

DI's price is now about the same as for an imported filter (with duty fees); they intend to try lowering their price enough to be cheaper than imported filters. Economic liberalization has helped their business, especially in terms of the booming power sector. DI is working on ISO 9,000 certification. They are exploring possible collaboration on air filters for vehicles with several large companies, such as TATA and AGIP. The company plans to expand in a "slow but steady" fashion.

TEST activities. Donaldson suggested that the Indian partner apply to ICICI for a loan to finance the proposed facility on an industrial estate outside of Delhi. ICICI was keen to help, a little slow getting started, but the financing has gone well. DI has since needed additional financing, but has used other sources than TEST, including an extension of credit from Donaldson and financing from ICICI using routes other than TEST. DI has had no need to use other TEST services.

Other companies have asked about the financing that DI Filters obtained from TEST. DI does not know whether these companies have sought similar assistance.

Issues. DI Filters did not need any services from TEST other than financing, and it could have gotten financing from other sources. According to Sanders International, Donaldson thought that the TEST financing was a major catalyst for the joint venture; this perception did not come out during the evaluation interview with DI Filters.

ELECTRONICS CORPORATION OF INDIA LTD. (ECIL)

Background. ECIL is among the ten largest national public sector corporations. Its Instruments Group (one of seven groups) wants to expand into manufacture of environmental analytical instruments, to be sold at affordable prices that will enable it to be commercially viable[2] (the Instruments Group is obtaining ISO 9000 certification). It sees a huge need for reliable environmental instruments both in India and in the wider Asian market.[3] ECIL believes that this gap can be better filled by acquiring U.S. technologies than by using the results of local research and development in India. ECIL may want to explore manufacture of pollution control technologies in about two more years.

ECIL has limited funds for licensing and joint ventures, but it anticipates being able to borrow needed funds from ICICI, IDBI, or other sources.

TEST activities. In 1995, ECIL arranged through ICICI for Sanders International to conduct a technology search in the areas of air and water quality monitoring (ambient and point source) and chromatography. Afterwards, USAEP sponsored a trip for two ECIL representatives to the U.S. As a result, ECIL is entering into definite commercial arrangements for air and water quality monitoring instruments, and negotiations are ongoing for gas chromatographs. It is close to reaching agreement on a trial use of passive samplers in Agra (badges worn by visitors to the area under study), but is being hampered by a lack of response by the state pollution control board.

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[2]ECIL aims for a 10-20% profit margin.

[3]ECIL has classified potential customers as follows: pollution control boards and other regulatory agencies; municipalities; testing laboratories; existing and new industries (especially oil/petroleum/petrochemical sectors, power plants, iron and steel industries, cement plants, drugs and pharmaceuticals, tanneries, pesticides and fertilizers, organic/inorganic industries); mines (especially monitoring underground safety for workers); common effluent treatment plants; and national river and lake authorities.

Issues.

1. ECIL was a very focused client and has made good use of TEST and USAEP technical assistance services.

2. ECIL found ICICI to be generally helpful but a bit slow to respond. Sanders International was very good about initial response and follow-up; ECIL has dealt almost exclusively with Sanders except for paying search fees to ICICI.

3. ECIL does not expect to need special help with funding.
4. ECIL is very frustrated by the failure of the State Pollution Control Board to respond to their offer of a free testing of the passive samplers.

5. ECIL did not realize until its meeting with the evaluation team that it could apply to TEST for technical assistance more than once.

FEDERATION OF INDIAN CHAMBERS OF COMMERCE AND INDUSTRY (FICCI)

Background. The Federation of Indian Chambers of Commerce and Industry (FICCI) has been active in Indo-US trade activities. FICCI has constituted a special committee to look into environmental issues and has a unit looking after the functions related to environmental management.

FICCI's perception is that environmental services and technologies are picking up though they seem to be in need of being further pushed. The number of Indo-US tie-ups are increasing. Such trend is likely to continue for quite some time.

TEST Activities. FICCI has received various trade delegations from the United States and organised workshops and other events to sensitise its members and promote the activities of TEST. A recent activity was held on June 5, 1996 to generate awareness about world-wide access to computerised information through Internet.

Last month, FICCI organised the visit of two experienced and knowledgeable persons to the United States for an exposure to environmental services and technologies available in the United States in particular in the fields of management of water quality and hazardous wastes.

Issues. The requirements and expectations in the field of environment are changing with time. The mix of sub-projects under TEST will need to change for responding to such requirements and expectations. It does not seem, however, that such change is being planned in the implementation of the TEST project.

Under pressure from the regulatory agencies and, in particular, the judiciary, a large number of systems for pollution control and environmental management systems are likely to be established in India. Information exchange among them will need to be effectively established. So far, it does not appear that any serious action has been taken to evolve and operate a system to achieve a fair and sustained level of information exchange among the industries interested or engaged in environmental management.

IGNIFLUID BOILERS INDIA LTD. (IBIL)

Background. Ignifluid Boilers India Limited (IBIL) designs and manufactures various types of boilers in collaboration with Babcock Enterprises, France, including fluidized bed boilers, boilers fired with oil, gas, and bagasse, black liquor and waste heat recovery boilers for the paper pulp, sugar, iron and steel and cement industries. Sales for the 1995-96 period was 250 million INR and is expected to be 600 million INR in the 1996-97 period. IBIL's objective is to generate 1000MW of electricity by 2080 using the coal gasification technology.

TEST Activities. In May 1994 the Managing Director of IBIL, to follow up on air pollution control equipment leads generated by Sanders International, participated in a USAEP trade mission to the US for the Indian boiler industry. During that visit he met with principals in the Tampella Power Corporation, Detroit, Michigan. He also met with Castone International in Texas and Besser International, Michigan. The discussions with Tampella to produce Tampella equipment in India under license led to a request for a loan from ICICI under the TEST Project which was sanctioned in September 1994. During the discussions Tampella was purchased by a Norwegian group which terminated the discussions. The loan was terminated by ICICI in the spring of 1996 due to lack of activity.

Issues. Three points were made during the IBIL interview:

1. Ignifluid does not consider the TEST interest rate for loans attractive because money can be borrowed at a lower rate offshore.

2. High level management personnel find it difficult to participate in missions where there is no flexibility to fly first class at times more convenient to their own schedules.

3. The IBIL Managing Director indicated that he felt that Sanders International did an effective job of generating useful leads and would consider using the services again if the need arises.

KIRLOSKAR AAF LTD.

Background. In July 1992 Kirloskar Ltd., a 2,500,000,000 Rupee engineering company in Bangalore, and Snyder General Corporation, Louisville, Kentucky, created a 50/50 joint-venture to produce and sell Snyder air pollution control equipment for application in the cement, steel and metallurgy industries in India. In 1994 American Air Filters International (AAF), a US company with annual sales of $1.2 billion in the US and $20 billion globally, acquired Snyder General and its 50 percent interest in KAAF. In 1995 AAF was acquired by and is now 100 % owned by the Hong Leong Group, Hongkong. Currently KAAF produces a variety of air and water pollution control equipment including electrostatic precipitators, bag filters, wet scrubbers, fabric collectors and gas cooling and conditioning systems for most industries but especially for power generation, pulp and paper production, cement and rock processing, iron and steel production and waste to energy applications. The association with Snyder and the subsequent windfall of becoming associated with AAF, a major global leader in APC systems, has made the joint venture very successful. Total sales for the three years from inception, predicted to be 300,000,000Rs, actually came to 933,300,000Rs. The primary driving force has been the growing demands to industry in India to meet increasingly stringent environmental regulations.

TEST Activities. In 1993, KAAF, a client of ICICI, was informed by ICICI about the TEST Project and the availability of money for environmental projects at 12.5 percent. KAAF applied for a loan for 59,000,000 INR to cover 65 percent of the 89,000,000 INR costs of building the plant and acquiring the equipment needed to activate the J-V. They received the loan sanction in July 1993. Since KAAF sales have grown at a rate well beyond what had been planned, the plant that was built in 1993 with the TEST funding, has had to be expanded to now 1.5 times the original size. The primary interest in TEST Project was the ability to get lower interest money with liberal repayment conditions. They were able to activate the loan two to three months sooner than what would have been possible with a conventional loan.

To date KAAF has used 50,000,000Rs of the original loan and have made two quarterly repayments beginning in May 1996. The only other services of the TEST program used by KAAF has been help in

locating information on other US suppliers of ESPs. In light of their rapid growth they would like to explore possibilities of expanding their loan or acquiring a new loan.

Since KAAF is part of a global conglomerate it already is active on the Internet and able to solicit most relevant information from its global partners. It may not find that the Home Page will be too useful.

Issues. The joint venture between Kirloskar and AAF has been and continues to be a major success. Persons associated with the TEST Project claim responsibility for its success. The following questions regarding the KAAF case should be answered:

1. Since the joint venture was in place, and it had already planned to spend the required money, prior to the TEST Project involvement can TEST justify its claim to responsibility for its success?

2. The loan was already in place prior to the purchase of AAF by Hong Leong. The history of Snyder/AAF/Hong Leong suggests that, in light of the growing trend toward global ownership, a clearer definition of an "American company" is needed.

3. Should the size of a company be included in the criteria for consideration for a TEST loan? Discussions suggest that the larger companies are more prone to recognize the value of the TEST but it can be argued that it should not be used to help companies that can well afford to obtain money through conventional channels.

KOTHARI SUGARS AND CHEMICALS LTD.

Background. Kothari established a sugar cane processing plant outside of Madras in 1961. Capacity has increased from 1200 tons/day to 2500 tons today. Kothari began diversifying its activities in 1988, partly to help offset licensing and import restrictions. Their chemicals division operates using technologies from the U.S., Germany and Switzerland.

In response to recent liberalization of the Indian economy, Kothari made a strategic decision to become more globally competitive. One of their ideas was to increase production capacity at the sugar mill to 4000 tons/day, using new technologies that would greatly enhance productivity. These technologies are also environmentally beneficial, but this was a side-benefit rather than a primary consideration.

The proposed changes in the plant were based partly on U.S. technologies that Kothari found in use in a Jamaican sugar cane plant. The changes include: separating the rind from the pulp, and selling the rind for paper manufacture; separating impurities from the rind before processing, some of which can be used in other economic processes; using a cheaper, more efficient means of extracting juice from the pith of the cane; and installing a much more efficient co-generation system. Environmental benefits include: greatly reduced use of chemicals to bleach both the sugar and the paper manufactured from the rind; and greatly increased energy production with reduced pollution.

TEST activities. Kothari had already received loan approval from IFCI for the entire 100 million rupees in financing needed when ICICI learned of this project, through a personal contact with a Kothari official. ICICI expressed strong interest in helping to finance the project. Since the TEST loan would be a few interest points lower, Kothari took a 35 million rupee loan from TEST; Kothari also obtained an interest-free loan of 20 million rupees from the parastatal Sugar Mission, and then reduced its IFCI loan by 55 million rupees. Kothari received a TEST brochure from ICICI but had no need to pursue any other TEST services.

The sugar plant has been on trial for about four months. The design and major components for the new technologies came from a company in the U.S., the only one that has this technology, so

far as Kothari knows. There have been some problems with processing the rind, but the tests so far have been largely successful and the plant should begin full operation in December 1996.

Kothari has already received many visits from other sugar manufacturers to see the plant. Making the plant available for such visits was a condition of one of the loans received (probably the one from the Sugar Mission).

Issues.

1. Kothari did not need any services from TEST. It already had complete financing but then accepted some financing from TEST because of the more favorable interest rate.

2. Would it be a good idea for TEST loans to include a requirement that recipients allow make the new facility(ies) available for inspection by other interested parties?

MIL INDUSTRIES

Background. MIL is a diversified engineering and manufacturing firm for air pollution control, with its origin in manufacture of hard and soft rubber liners for equipment exposed to corrosive substances. The company was founded in 1969. It entered into joint ventures in 1974 with a Swiss company (engineering services for electrochemicals) and in 1985 with a U.S. company (wet scrubbers) and a UK company (solvent recovery from air emissions for the chemical industry). It has a subsidiary that manufactures PVA-lined pipes, in collaboration with a UK company. MIL's niche is providing rather specialized, unusual technologies. The company has about 20 engineers, about 65 workers at its MIL factory, and about 25 workers at its subsidiary factory. Its annual turnover is about 200 million rupees.

MIL is very self-sufficient in its business exploration. The company monitors developments in its field and its president has strong background and contacts in the U.S. and UK. They have gone to ICICI for all their outside financing for the last 15-20 years.

TEST activities. MIL learned of TEST at an ICICI seminar in 1993 or 1994. (Mr. Harinathan of ICICI was at university with the head of MIL's engineering division.) In 1994, MIL asked TEST for help in identifying a U.S. source; by the time they received a reply, they had already identified through other channels[4] the same U.S. company recommended by the search. Later that year, MIL applied for financing from TEST to acquire a demonstration unit from the U.S. for recovery of multiple solvents (their UK system works for single solvents). After 6-8 months, ICICI offered a conditional grant. MIL decided not to take the grant because: (1) by that time they had a better feel for the market, and had been able to make some sales without the need for a demonstration unit; and (2) MIL was unwilling to provide the amount of equity required for a TEST loan because their

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[4]The U.S. company, Vara International, is a subsidiary of another U.S. company, Calgon, from which MIL has been purchasing activated carbon for many years.

investment priorities had shifted.[5]

In late 1995, MIL received a fax from SI asking if MIL would like to meet with EPR, a U.S. manufacturer of innovative air pollution control technologies that was visiting India.[6] EPR and MIL pursued the discussions in their initial meeting, with special reference to EPR's Aerodynamic Module, which captures air emissions. MIL's engineering firm is extremely enthusiastic about the technical and commercial potential of this technology in India. However, progress has been impeded because EPR believes that it will be necessary to import a demonstration unit, and MIL's management has been unwilling to commit new financial resources for this, at least in the next 12-18 months, because their investment budget for that period is already committed to other projects.

EPR has told MIL that EPR would like MIL to be its collaborator for the demonstration project proposed for an Agra iron foundry. MIL believes that they have explained very clearly to ICICI, SI and EPR that, at least for the next 12-18 months, they are only willing to invest in terms of manpower and administration until the point where EPR's units are actually selling in India.

A few days ago, MIL received word that this arrangement may be acceptable to EPR. In this case, MIL would essentially be

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[5]MIL mentioned that in another recent case, about one year ago they applied to ICICI for a loan to help with a proposed biotechnology project (this was not a TEST proposal because the proposed partner was not a U.S. company). It took a year for ICICI to process the application, and by then the parties had lost interest.

[6]In 1992 or 1993, the president of MIL met Jeff Hallett of SI while both were attending a conference in Seattle. Hallett recognized the name MIL (presumably because of contacts with ICICI regarding the application for financing in connection with the multiple solvent recovery system). At that time, the president of MIL mentioned to Hallett that the company wanted to diversify more in the field of air pollution control, including dry scrubbers.

representing EPR as a distributor[7] until the point where the EPR technology is selling in India. Then the relationship could shift to a transfer of technology know-how, with MIL eventually developing capacity to manufacture the technology in India, in a joint venture with EPR.

During the meeting with the evaluation team, MIL mentioned that they are interested in locating technologies for cleaner production of paper. When the team explained that MIL could contact SI/ICICI for help in researching possible U.S. sources, they were very interested. Even though ICICI has given MIL information about TEST services, MIL apparently did not realize that this type of service is available.

Issues.

1. Is the length of time that ICICI takes to process loan applications an impediment to business transactions (or does that fact that MIL and/or its potential partners eventually lost interest a reflection on the viability of the underlying business proposals)?

2. It is still unclear whether MIL's refusal to invest financial resources in a demonstration unit is acceptable or not. Would/could this issue have been resolved more quickly if TEST's institutional component had a representative present in India?

4. Is there any more that ICICI could reasonably do to make its clients more aware of the range of services available from TEST? Would awareness and understanding be enhanced by the presence of a full-time technical assistance presence in India (for closer communication with ICICI and potential TEST clients)?

5. SI's tracking system was efficient enough to prompt it

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[7]MIL noted that at least in the early stages, and possibly for longer, it would not be interested in maintaining an inventory of stock in Madras. It would prefer to order equipment as needed; the delays in shipment would not be a problem, so long as orders could be filled within 3-6 months.

to contact MIL in connection with the EPR visit to India, about 3 years after a casual meeting between MIL and SI representatives at a conference.

NATIONAL PRODUCTIVITY COUNCIL (NPC)

Background. The National Productivity Council (NPC) is the apex body coordinating similar bodies for the various states and important industrial centres in the country. NPC focuses particularly on the small and medium scale industries. The concept of productivity matches with those for cleaner production, minimisation of wastes and quality control.

The Environment Division of NPC has been active in carrying out studies and imparting training in waste minimisation, environmental audit and environmental management systems. NPC has studied and demonstrated waste minimisation in the electroplating industry under a project sponsored by the Ministry of Environment and Forests.

TEST activities. Senior members of the staff of NPC were associated with the market survey carried out in 1991 for the project proposed by USAID for Trade in Environmental Services and Technologies in India. Since then NPC has not been involved in the TEST project. On two occasions, probably under USAEP, an NPC representative was included in the delegation for study tours to the U.S.A. during the implementation period of the TEST project.

Issue. NPC feels that it could provide useful technical inputs to the TEST project to assist ICICI and that the latter may be in need of such assistance. In the implementation of the TEST project, greater attention may have to be devoted in future to the technical aspects. Therefore, the role that can be played by NPC may be of particular interest. CTI/I plans to invite NPC participation in some TEST activities.

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SHREYANS INDUSTRIES

(see also, write-up on Agro Pulping Machinery Limited)

Background. Shreyans Industries produces 85 tons/year of high grade papers from agricultural waste products which yields a black liquor effluent. The dumping of the black liquor waste has contaminated rivers and other drinking water sources. Mounting pressure from resident neighbors of the Shreyans Plant forced them to explore other methods for disposing of the black liquor waste.

TEST Activities. Agro-Pulping Machinery Ltd, an engineering firm in Madras and the Indian representative for Enders Process Equipment Corporation, approached Shreyans in 1994 and convinced them to undertake a 123,000,000 R demonstration project using the Enders process for disposing of black liquor effluents from agricultural waste based paper mills by converting the black liquor into saleable sodium carbonate. Agro-Pulping, who learned in August 1993 about the TEST Project when seeking a loan for themselves, made Shreyans aware of the possibilities of obtaining partial funding from ICICI and the TEST Project. A loan for 38.5 million INRs and a conditional grant for 14.7 million INRs were sanctioned in August 1994. Agro-Pulping undertook and completed installation of the equipment in June 1996 which is now fully operational.

Shreyans have not partaken of any of the other services of ICICI but do have an interest in further improvements in the process which may require utilizing the TEST Project services.

Issues.

1. The conditional grant component of this project is the only conditional grant issued under TEST.

2. Agro-Pulping was the primary catalyst in the undertaking at Shreyans Industries by, first, encouraging them to install the equipment and, second, making them aware of the TEST Project loan program. ICICI's major role was in letting Agro-Pulping know about the project and, after the project was commissioned, using it as a way to promote the TEST Project activities. The Agro-Pulping/ Shreyans project suggests that other three-way opportunities exist which can

further aid in meeting the end goals of the TEST Project. Even though ICICI was not involved in the creation of the arrangement between an American and an Indian firm they did facilitate exploitation of an existing partnership.

SMALL INDUSTRIES DEVELOPMENT BANK OF INDIA (SIDBI)

Background. Small-scale industrial units number nearly 2.5 million; they produce 7,500 kinds of items, and share 36 per cent of the value of the products exported from India. SIDBI is the apex development bank for the small scale industries. SIDBI refinances national banks and also provides direct financing, especially in the emerging areas.

SIDBI's corporate policy lays special emphasis on technology upgrading which includes a thrust on environmental management. Programmes for achieving energy efficiency and pollution control are encouraged by SIDBI with appropriate inputs, and small scale industries are assisted in complying with pollution control norms.

In recent years, SIDBI supported various workshops and awareness programmes on pollution control and environmental management for specific industrial sectors which included textiles, electroplating, pharmaceuticals, dyes and dye intermediates. These programmes were carried out at various stations in collaboration with the National Productivity Council, the Central and State Pollution Control Boards, the Indian Institute of Technology, the National Environmental Engineering Research Institute and the Centre for Environmental Education. SIDBI convened satellite interactive network programmes for ISO 9000 and for industrial environmental management for green profits. SIDBI has identified 16 clusters of small scale industrial units for special attention under its technology development and modernisation programme. In collaboration with the United Nation's Asia Pacific Centre for Transfer of Technology, SIDBI has established a Technology Bureau for Small Enterprise. SIDBI also has a vendor development programme in which a large mother unit may propose the development of its small scale ancillary units.

SIDBI deals with the World Bank and UNIDO for the sub-projects related to the implementation of the Montreal Protocol to reduce the consumption and release of ozone depleting substances in certain sectors. SIDBI onlends soft funds received from KFW of Germany and OECF of Japan for projects which have emphasis on pollution control and modernisation.

TEST Activities. SIDBI has not been associated with the activities of the TEST project.

Issues.

1. Small scale industrial units are mostly located in clusters. Their capability to manage environmental problems is severely constrained by logistic, technical and financial factors. Because of the large number of small units and their diverse problems, it is not easy to address their problems through a single agency like ICICI.

2. SIDBI authorities seemed to be keen to participate in the TEST project. SIDBI's own activities are limited to the small scale sector but their programmes for pollution control and modernisation are apparently in line with the objectives of the TEST project. SIDBI has experience and is apparently capable of managing the technical and funding activities of bilateral projects in the establishment and modernisation of industrial units and installation of pollution control facilities. Would it be appropriate for SIDBI to help implement TEST activities for small scale industries and, if so, what actions will be needed with respect to the amendments to the existing project agreement with the Government of India and the ICICI?

3. If TEST as modified for CTI/I includes a component to promote "environmental due diligence" in lending activities, would SIDBI be a good candidate to participate?

TTG INDUSTRIES

Background. TTG provides technology on a "turn-key" basis, assisting clients with identifying the needed technology, installing it, and training workers in its operation and maintenance. The company began about 12-13 years ago providing services to clean coke over doors in steel plants, using high pressure jet water cleaning. It has since diversified into several areas, including air pollution control. TTG is a medium-sized company with about 250 employees. Annual turnover is about 10 billion rupees.

TTG uses a number of different financing sources for its activities. In terms of development banks, it usually approaches: the Industrial Development Bank of India for total project funding and/or assistance with project development; the Industrial Finance Corporation of India for funding non-conventional energy technologies; ICICI for partial project funding; and State government investment agencies for smaller loans.

TEST activities. TTG learned of the TEST program from promotional material provided by the Indian government. (They did not recall whether this came directly from ICICI.)

In 1993, TTG successfully applied to ICICI for a TEST loan to help TTG pay for air pollution control technologies from Davy International that it installed for Hindustan Copper Ltd. for three smelters, at different locations. (Two smelters needed a double hood system to recover sulfur dioxide emissions, which could then be converted to sulfuric acid; the third smelter required removal of SO_2 gas from the slag cleaning operation.) TTG had already identified Davy International's technology (partly through information available at the U.S. Embassy) and only needed help with financing.

In 1995-96, TTG applied successfully for a second TEST loan, this time to help Sterlite Industries install different technologies to capture sulfur dioxide from their copper smelter and convert it to sulfuric acid, using technologies from SWEMCO Inc. (to cool and clean the gas) and JOY Environmental Technologies (removal of SO_2 mist from the ESP). The gas cleaning plant is now being tested, it is expected to start operating in December 1996.

TTG has not needed any help from TEST other than financing, and was not aware of what other services TEST can provide.

TTG considers the U.S. technologies for gas cleaning of copper smelters to be highly competitive. There are a limited number of copper smelters in India. A few new ones are being built, and TTG has bid to provide similar controls for some of them; if successful, it expects to propose using U.S. technologies.

Issues.

1. TTG did not need any services from TEST other than financing, and it could have gotten financing from other sources.

2. Apparently, ICICI did not inform TTG about other services available from TEST. Perhaps this was because ICICI perceived that TTG did not need any other services.

TECHNOLOGY TRANSFER ASSOCIATION (TTA)

Background. This is a "one-man" NGO founded in 1991 by Mr. Y.H. Gharpure, a retired chemical engineer who also has several business interests. TTA provides free information to its members about sources of technology for the chemicals sector, broadly defined. TTA also publishes highlights of its available in Chemical Weekly, with circulation of about 70,000.

TTA's information covers: sources of technology worldwide; inquiries from members about technologies they are seeking; joint venture opportunities; and used chemical facilities and turnkey plants available for sale (mostly from the U.S.). Mr. Gharpure obtains information for his database from professional journals, correspondence, seminars and conferences, and TTA members. The database includes but is not limited to sources of environmental technology for the chemicals sector.

TTA has about 500 members. About 10-20 new members join each month, which Mr. Gharpure says is an unusually high rate. Members are from all over India, as well as a few from abroad. Members include a wide range of government agencies and parastatals, private companies of varying sizes, banks, and individuals. Mr. Gharpure operates TTA with the help of a typist and a part-time computer technician.

Apparently, TTA offers a unique service, especially since it crosses into all parts of the chemicals sector, in contrast to the specialized industry associations. Mr. Gharpure would like to expand the environmental component of TTA's database and make the information available on the Internet. The database would have two components: general information about various types of technologies[8] and detailed information on about 10,000 of the

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[8]Clean technologies (to the extent they are available in the chemicals sector); recovery; reuse and recycling; biotechnology; energy efficiency; and, eventually, nanotechnology (harnessing natural processes more directly, as opposed to mimicking them artificially with chemicals). Eventually, he would like to build capacity to rate the reliability and suitability of technologies in the database.

70,000 chemicals available on U.S. chemical databases.[9] Potential users without direct access to the Internet would be able to access information through their trade associations. TTA would charge only enough to make the operation economically self-sufficient.

Mr. Gharpure has identified a U.S. software company that would like to undertake this project with him (the U.S. company is prepared to invest up to $200,000 initially, with up to $.5 million eventually if the project is successful). He needs financial assistance to help with start-up costs, such as hiring staff, acquiring premises and obtaining equipment and data.

TEST activities. Mr. Gharpure has been conducting a dialogue with ICICI's TEST unit since 1993. ICICI has been encouraging, but has urged that TTA become better established before applying for a TEST loan, which would put TTA at risk should it default on payment. ICICI and Mr. Gharpure are discussing various options, including a combination of grant or conditional grant and loan. TTA has recently applied to the state government for a small land allotment (provided to NGOs) and launched an appeal for help in establishing a building fund. For the other costs of start-up, Mr. Gharpure has only approached ICICI's TEST unit for help. The TEST unit told the evaluation team that they expect to come to some arrangement with TTA in the next few months.

Issue. How thoroughly has ICICI evaluated the feasibility and suitability of TTA's Internet proposal, both in technical and institutional terms? With regard to the latter, is it advisable for TEST to finance an information network that is so dependent on a single person, even when he is as energetic and dedicated as Mr. Gharpure? What are the implications for sustainability of the project? Would there be feasible options for linking TTA with FICCI or ICICI's information unit or some other potential institutional partner?

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[9]He would include for each chemical relevant information about manufacture, processing and waste streams.

VARUN INDIA LTD.

Background. Varun India Limited, a subsidiary of the INALSA Group, was started in 1989 and is a manufacturer of a variety of filters for automotive and other industrial applications. In 1990 they began discussions with PNEUMAFIL Corporation, Charlotte, NC to produce air intake pulse jet filter cartridges for gas turbines using PNEUMAFIL technology. VARUN filter sales are approximately $1 million, overall sales (including hand water pumps) are at $3.2 million. INALSA sales are at the $20-30 million level. The VARUN filters produced under collaboration with PNEUMAFIL are currently not sold to the original equipment manufacturer markets but do have a 25-30 percent share of the replacement and spare parts markets.

TEST Activities. In June 1993, at a CII seminar, they were made aware of the TEST Project and initiated discussions with USAID and ICICI to determine if they could benefit from the program. USAID, as a first step, funded a trip to the US for the VARUN people to finalize arrangements with PNEUMAFIL. (According to Sanders International, the TEST support was crucial; until that point, Pneumafil had strong doubts about the suitability of Varun as a business partner; this point did not emerge during the evaluation interview.) This subsequently lead to application for a 12,400,000Rs loan under the TEST Project at ICICI. VARUN people spoke highly of services and help received from AID, ICICI and Sanders International in arranging the trip and the loan.

Of the original loan VARUN has committed all of the funds except 400,000Rs which is being held by ICICI until VARUN completes securitization paperwork. First payment on the loan is due in 1997. VARUN has not availed themselves of any other TEST Project resources but indicate that now that they have been made aware of the Home Page that they will explore if it is useful.

Issues.

1. The TEST Project clearly facilitated negotiations between Varun and Pneumafil. According to Sanders International (SI), TEST did more than simply facilitate -- it provided Varun with needed credibility. This was one of several examples where SI identified points that did not come out during the evaluation team's interview with an

Indian participant in TEST.

2. Can acceleration of a project be a justifiable criteria for selection of candidates for TEST funding?

3. The VARUN filters do not directly impact the environment, their prime function is to clean the air being fed into the gas turbines. They have a secondary impact in that they increase the operating efficiency of the turbine and as a result reduce fuel consumption and toxicity and particulate levels of the exhaust. Many technologies have secondary and tertiary impacts on the environment.

4. Should the selection criteria for candidates for TEST Project funding be more open to capture not immediately visible contributors to a cleaner environment?

VENTAIR PRIVATE LTD.

Background. Ventair is a small company with 8 employees that sells equipment for improving indoor air quality. The equipment is manufactured by Acmie Corporation, an affiliated company that employs about 30 people in its factory. Ventair's market niche is with small industries in southern India.[10] Ventair and Acmie have annual turnover of about 10,000,000 rupees. Ventair wants to build its business by acquiring improved technical know-how and/or entering a joint venture to manufacture air pollution control equipment. They would also like to expand into air quality monitoring, an area where they see a great need for better capability. They want to expand their marketing and may hire some regional representatives. Ventair sees potential to triple their business in the first year and then grow at about 40% per year.

TEST activities. In 1995, Ventair arranged through ICICI for Sanders International to prepare a technical search report on U.S. companies offering relevant technologies. In March 1996, Ventair's president visited the U.S. with support from TEST and USAEP. Ventair hopes to be awarded a contract soon that would involve using equipment from Beltran, one of the U.S. companies he visited. The main component would be imported from the U.S., supported by technical advice. If this job is successful, Ventair and Beltran would explore a licensing agreement or joint venture. Beltran would not need financing for the initial transaction, but would need to borrow money for a larger commercial venture with Beltran.

Beltran recently asked Sanders International for help in identifying U.S. companies with technologies for air pollution monitoring. Sanders provided a list of about 20 companies, free of charge. Beltran has not yet identified potential partners but it would like to, and financing a commercial agreement would probably require outside funding.

Issues.

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[10]Ventair's potential competitors are similar companies, plus air conditioning companies, that occupy similar niches in other parts of India.

1. Ventair has been very pleased with the research reports and business exchange services provided by TEST and USAEP and there is good potential for these to lead to useful commercial transactions.

2. SI reported the transaction between Ventair and Beltran as being definite, whereas Ventair said that it is pending award of a contract.

VIMTA LABS

Background. Vimta Labs Ltd. was established in 1984 by its founder and managing director, Dr.S.P.Vasireddy. The laboratory is now housed in a well equipped building having central air-conditioning, CCTV and high standards of security and sanitation. It has received certification under ISO 9000 and ISO 9002.

Vimta Labs has six divisions, one each for environment, drugs & pharmaceuticals, biosciences, chemicals, material testing and training. About 30 per cent of its business is carried out in the environment division.

Vimta Labs have wide ranging capabilities in the environment sector covering environmental impact assessment, environmental management planning, environmental audit, monitoring, treatment, plant design, risk analysis, and environmental chemistry related to effluent, soil, surface and ground water, stack monitoring and hazardous waste.

TEST activities. Information about the status of the activity of Vimta Labs under the TEST project was obtained through telephonic conversation with Dr.S.P. Vasireddy on 25 November 1996. Vimta Labs has been in touch with Ms.Sarupa Ganguly of Sanders International and about 10 US companies. Negotiations made some progress with one of them, namely Roy F.Weston, but got stalled due to lack of enthusiasm on the part of the US companies.

Issue. Vimta Labs is clearly a suitable party for receiving and utilizing U.S. know-how in environmental services. Vimta Labs seems to have a feeling that its efforts were unilateral in this endeavour. The experience is contrary to the general view that a good deal of "hand holding" had been done under the TEST project for match-making.

WORLD BANK

Background. The World Bank is the leading development bank engaged in promoting economic and social progress in the developing countries. In the World Bank group of organisations, loans are provided by the International Bank for Reconstruction and Development, grant and funds on nominal rates of interest are provided by the International Development Association, and private investment, both foreign and domestic, is encouraged by the International Finance Corporation.

Protecting the environment is identified by the Bank as one of the five major development challenges. In India, the Bank has funded the Industrial Pollution Prevention Project (US $ 250 million) in four states. The Bank has funded certain other projects that have a bearing on environment. These include the projects for restructuring cement industry (US $ 300 million), improvement in the efficiency of power utilities (US $ 265 million) and development of renewable resources (US $ 190 million).

Currently, the World Bank is also managing the ODA-funded study on environmental management issues in the power sector and the OECF-funded formulation of a project for environmental improvement in Delhi and Surat. World Bank is formulating an investment project for treatment and disposal of hazardous wastes and also technical assistance projects for building up environmental capacity, environmental management in coal mines, aquaculture, and trade effluent.

TEST activities. The World Bank has not participated in the TEST project.

Issues. In the proposed technical assistance for national environmental capacity building project, a comprehensive and multi-disciplinary approach is likely to be adopted to cover the technical, legal, economic, organisational (governmental and non-governmental) and research aspects. It may be worthwhile considering whether the aspects to be covered under the TEST project should be widened on similar lines.

The TEST project has maintained a focus on the industrial sector. Environmental services and technologies find application in other

sectors also (such as urban improvement, laboratory services, soil remediation, phasing out of ozone depleting substances, and environmental monitoring and audit) that have not been specifically dealt with under the TEST project.

TEST should monitor whether any CTI/I activities as they develop might be linked to World Bank activities noted above, and if so, consult with the World Bank. Also, CTI/I should learn more about environmental lines of credit provided by the World Bank, particularly if TEST may offer information about possible sources of financing to TEST participants. It might also be useful to consult with the World Bank to see what information they may have about the environmental market in India.

Appendix 3A

ICICI COMMENTS ON APPENDIX 3[1]

[1]The team received them too late to incorporate them into Appendix 3.

THE INDUSTRIAL CREDIT AND INVESTMENT CORPORATION OF INDIA LIMITED

TRADE IN ENVIRONMENTAL SERVICES AND TECHNOLOGIES (TEST) PROGRAMME

Appendix 3A

Clarifications on issues raised through extract of interviews

Agra Iron Founders Association (AIFA)

Issue- 1

ICICI-TEST Group (ICICI-TG) has been concentrating on transfer of EPR technology to India rather than demonstration site. However, USAID opined Agra as a good demonstration site, inspite of ICICI-TG's own reservations, in view of pending decision by the judiciary. However, ICICI-TG still feels that the said technology has good market potential for foundries elsewhere in India and other Industrial sectors such as cement, steel.

Issue - 2

While the cost of equipment for Agra Foundry unit is estimated around Rs 400,000/-, the cost of demonstration is estimated at Rs 35,00,000/- (US $ 100,000). In view of this, ICICI-TG has been recommending to AIFA to opt for an intermediatiary who will be able to absorb the differential expenditure and spread it over number of future sales to be financed by outside agencies (TEST can fund only the first demonstration project and other beneficiaries are expected to approach outside funding agencies for meeting their funds requirements). While MIL has shown interest, it has not agreed to invest any money for this business since it is not in their business plans for the next 15-18 months. ICICI-TG and USAID programme officer are exploring the possibility of other Indian vendors joining hands with EPR and going in for the demo project. The latest information is that, EPR has received 2 more collaboration offer proposals and has to decide it's partner (as of December 11, 1996).

Issue - 3

EPR and MIL were holding discussions for doing the trading business during the period under reference. Both ICIC-TG and SI have been contacting the parties involved for speeding up the matter, without much progress.

Issue - 4

Yes. ICICI has been informed by National Small Industries Corporation (a beneficiary of KfW, Germany), that they have developed a low cost air pollution control system for foundries in Howrah, near Calcutta and the same is being sold to the respective beneficiaries. It is learnt that NSIC did not look at Agra, as a promising site, as the foundries in Agra are to be closed or relocated with a better manufacturing technologies/facilities.

Agra PEDI-CABS

Issue- 1

Even though ICICI-TG is fully aware of the happenings in Agra, the proposal for introduction of environmentally safe pedi-cabs falls outside the scope of the TEST project.

Issue - 2

See reply to issue - 1

Agro Pulping Machinery Limited (APML)

TEST Activities

It may be mentioned that ICICI-TG, came to know about the alliance between APML and Enders through press meet cutting in July 1993 around the time SI became the Institutional Contractor (IC) and with the help of SI located Enders in USA. A contact was established with APML and it was invited for discussions.

Issue

It is not correct to state that TEST was not responsible for bringing the Indo-US alliance. APIC - Enders alliance would have remained only on paper, without ICICI-TG intervention. However, TEST acted as a catalyst to bring together APML and Shreyans Industries for business with financing through a combination of loan and conditional grant. It may be mentioned here that, during the last 20 years, attempts have been made to develop technologies all over the world (including India) for treatment and disposal of black liquor from agro based pulp mills. However, none of the technologies developed (including one developed under ICICI-PACT) have been commercialised.

Issue- 1

Out of the 13 proposals sanctioned so far, 11 have been assisted to procure US environmental technologies for onward offer to the Indian Industries, to overcome pollution problems.

Asian Development Bank (ADB)

No observations warranting comment from ICICI-TG. However, ICICI-TG would like to clarify that ADB provides funds through financial intermediaries. for end of the pipe business. while TEST provides financial assistance towards creating net work of vendors for providing equipment/commodity/services, to industries availing assistance from ADB.

Biotech Consortium India Limited (BCIL)

Test Activities

It has been wrongly mentioned that BCIL was involved in developing the TEST brochure. In early 1995, BCIL was appointed by SI as sub-contractor to organise 3 workshops (Delhi, Chennai and Mumbai) wherein 5 US biotechnology service providers offered their technologies to the Indian Industry. BCIL was also expected to follow up the leads generated in the workshop and assist the Indian applicants for possible help in adopting US biotechnologies, with the approval of the Government authorities. In fact ICICI-TG took initiative in developing proposals for 3i Systems, one of the US companies that visited India in the above workshop and an application for financing is awaited.

Issue- 1

Yes.

Issue - 2

BCIL is an autonomous organisation, jointly promoted by ICICI with other development banks (IDBI, IFCI). It receives substantial grants from the Government of India, for meeting major part of the expenditure in promoting its business goals. There is no bar on TEST involving BCIL for its business provided the business, brought in by the latter is within the ambit of TEST.

Confederation of India Industry (CII)

The reference that "installations under TEST Project in many cases remain isolated and so far without multiplier effect" is wrong. Copies of TEST brochure and success stories (Annex 14) are available with CII, providing them adequate information about the nature of TEST activities and projects assisted.

The objective of TEST, is to create only sample projects and/or vendors in different fields (services/manufacturing/turnkey contract) and make the same available to the large community of the end user industries. Therefore, the above observation does not hold good for TEST. As regards multiplier effect, it may be mentioned over 100 industrial units located in various parts of India, have procured their requirement of pollution control equipment/services from TEST assisted Projects, (TTG, Kirloskar MF Ud., ACC, D.I. Filter Systems Limited and Varun India Limited). This multiplier effect has been achieved by the TEST sub-grantees during the first 2 years of their coming into existence. At the end of the TEST Project life, we may expect the number of users for these sub-grantees to go up further substantially.

Most of the industries referred in the report have already been covered by TEST funded Vendors. It has been mentioned, cleaner technologies should be assigned highest priority. Kothari Sugars and Chemicals Limited (KSCL) proposal envisages manufacture of sugar as a clean manufacturing activity with possible multiplier effect of over 400. The usage of by-products, from this clean

technology activity (Rind and Molasses), is also expected to result in cleaner production of paper and industrial alcohol. (Possible multiplying effect of around 200 and 300 units respectively).

Electronic Corporation. of India Limited (ECIL) proposal for manufacture of monitoring instruments is expected to materialise into an Indo-US business relationship in the near future. ICICI-TG has also received an application from BRS instruments, Bangalore for TA, for manufacture of monitoring instruments.

Though we provided technical information to a Chennai based company for Identification of technology for noise pollution control, the latter is yet to formulate his plants for availing financing.

D.I. Filters Systems (I) Limited (DIFSL)

DIFSL's proposal was directly developed for loan financing. After some delay, DIFSL was able to submit justification for funding under TEST and obtain the loan, within the shortest possible period (chronology of events given in Annex 15). While technically it may be possible that other funding sources could have been used by DIFSL, the latter decided to opt for TEST funding.

Electronic Corporation of India Limited (ECIL)

Issue- 1

No comments

Issue - 2

ICICI-TG records (summary attached as Annex 16) indicate they were fast in attending to the enquiry. Being a government organisation, the latter could not decide about making the contribution for Technical Search Report (TSR), for a long time.

Issue - 3 } No comments
Issue - 4 }

Issue - 5

ICICI-TG is surprised to note that ECIL was unaware of possibilities for multiple number of applications for TA, since additional technology sourcing through TEST was discussed during the visit of Shri Bhatia, the then General Manager and Shri Gopalakrishnan, Senior Manager, prior to their Business Exchange tour.

While it is true that, any applicant can make multiple number of applications for TA, it may be noted TA has been envisaged as a tool to provide funding, for creation of Indo-US long term business. Wherever TA was sought without any loan possibility, there is no point in accepting multiple

applications, which would not result in TEST funding. (ICICI-TG has not rejected any proposal which did not envisage any loan funding after the applicant avails TA).

Issue - 6

No comments

Federation of Indian Chambers of Commerce and Industry (FICCI)

Issue

"Mix of sub-projects under TEST will need to change for responding to such requirements and expectations. It does not seem however that such change is being planned in the implementation of the TEST Project". ICICI-TG disagrees with this observation. As already elaborated during the visit of MSI to ICICI, ICICI-TG had elaborated its action plan, which governs all environmental business sector (manufacturing, consultancy, laboratory/monitoring services, region, loan, conditional grant etc.). A detailed review of the activities under various heads has also been furnished to the visiting team (copy formats attachment to the report from MSI). With the available funds of only 8 million dollar over the period of three and half years, ICICI-TG has managed to spread its business as elaborated in its reports (copies of same also form part of the report from MSI).

The list of applications/enquiries on hand, also covers newer areas such as solid waste disposal through landfill, hospital waste treatment, incineration, package waste water treatment plant, laboratory services, etc.

ICICI-TG is pained to note a serious remark about its working. As already mentioned in person, ICICI-TG has been attending number of seminar/workshops/conferences (list attached as Annex 11) for securing possible business for TA/Loan financing. It may be reiterated that the object of TEST is to create technology vendors in the country who will be able to offer their service products to the large community of Indian Industry, facing environmental problems. It appears that FICCI expects TEST to fund all the polluting units to be addressed and assisted in overcoming their problems, whereas TEST envisages offering a solution provider for each of the technical problems.

It may be noted here that, inspite of inadequate funds for lending activities, ICICI-TG could solicit unique problem proposals for TA/funding from various parts of the country.

Ignifluid Boilere India Limited (IBIL)

Issue - 1

IBIL's management has not indicated the actual cost of raising funds abroad (over 8.5 %) with hedging arrangement. Therefore, this comment needs to be reviewed.

Issue - 2

ICICI-TG took the initiative for approving cost shared tours and introduced financing of US expenditure, out of grants funds and left the international travel financing to the applicants themselves. USAEP started adopting this strategy after hearing from TEST.

Issue - 3

No comments since, to the best of our knowledge, Sl happens to be IBIL's overseas representative.

Kirloskar AAF Limited (KAAFL)

Issue - 1

TEST project envisages assisting Indo-US joint business in the environmental sector, whether the proposal is developed through promotion or TA. At the time of planning, TEST project report considered KAAFL, as one of the potential proposals as a fast track proposal for commercial development. (page 1-6 and 1-7 of project report).

In ICICI-TG's opinion, any Indo-US Environmental Services Sector business meeting the criteria for financing should be accepted.

Issue - 2

USAID has already clarified the definition "An American company" as a company incorporated in USA or a company owned (51% and more share holding) by an American company, outside USA.

Issue - 3

This issue was discussed at the advisory council meeting held in December 1993, and it was agreed that both the sectors (large and medium) require TA/financing. An equipment/service from a small unit can be bought by a larger firm for meeting its pollution prevention or vice-versa. ICICI-TG feels there is no need for a blanket ban. However, ICICI-TG's endeavour will always be to assist small and medium size units.

Kothari Sugars and Chemicals Limited (KSCL)

TEST Activities

The entire write-up need correction for reasons given as under:
This technology was identified as a fast track proposal for commercialisation under the TEST Project report (section 18 - page 16). The technology for Cane Separation System (CSS) was developed under PACT Programme and then USAID funded project being implemented by ICICI. Amcan Praj India Limited, a joint venture between Amcane International USA and Praj Industries, Pune, was

formed to commercially exploit the technology developed. For over 2 years, they were searching for a customer. The then, chief of PACT requested TEST group to identify a customer for this project, with possible funding under TEST. Accordingly, chief of the TEST Group held discussions with the technology vendor and suggested to them, to contact KSCL for possible business. In view of the close business relationship during his tenure at Madras Office of ICICI, TEST group chief also contacted KSCL and fixed the appointment for this purpose. Thereafter, both the vendor and the prospective customer visited Jamaica and KSCL got satisfied with the smaller size working model of the CSS. When KSCL wanted to avail loan under TEST. it was noted that TEST had negligible obligated funds for on-lending to anybody. including KSCL's project. However, it was indicated that, in the event of cancellation of assistance to IBIL, ICICI-TG would be able to consider a loan out of the cancelled amount. In the meantime, in view of the uncertainties relating to obligation of additional funds, USAID wanted ICICI-TG to use this cancelled amount for other projects and advice KSCL to approach other sources for funding. Considering the good potential for the clean technology developed under another Indo-US Joint Venture project, ICICI-TG had to plead with USAID for funding this proposal. After long correspondence and discussion with USAID, the latter agreed that KSCL's proposal can be funded partly out of TEST funds (US $ 0.5 million) and reflow funds (US $ 0.5 million). In the meantime, KSCL had gone ahead and availed a corporate loan from IFCI for funding the project, without any examination of the Technology by the latter and only as a commercial borrowing. Sugar Mission of Government of India, also got involved only after TEST funding the project. USAID files will reveal the long drawn correspondence between them and ICICI-TG in this regard.

Issue - 1
The earlier write-up provides answer for this issue.

Issue - 2

ICICI-TG has already discussed with USAID for arranging an awareness workshop (on similar lines planned at Shreyans) and is awaiting the regular commissioning of KSCL's project based on cleaner process of manufacturing of sugar by inviting representatives from industry, State/Central pollution control boards, etc.

MIL Industries (MIL)

Issue - 1

ICICI-TG does not agree with the first observation that ICICI takes longer time to process an application leading to an impediment to business transactions (refer Annex 17). If an application is complete in all its respect, ICICI-TG sanctions assistance within 6 to 8 weeks. In respect of grant to CII, it took 2 days for sanction and release of funds. Even after providing leads through TA, MIL did not bother to submit a loan proposal for funding purchase of technology and its demonstration, as a conditional grant. In the meantime, MIL approached SPREAD Programme of ICICI, for funding as an In-house technology development for the same application. However, here also MIL did not show much interest in availing the sanctioned assistance of Rs 40 lacs and the same had to be cancelled.

Issue - 2

MIL's proposal for not investing in the business but seeking a loan/conditional grant is not acceptable to ICICI-TG as there is not provision in the project agreement for such assistance. Further, if such free funding is done for trading activities, TEST will be receiving hundreds of proposals for procurement of US technology/commodities without any Host Country Contribution. ICICI-TG does not agree that there should be a representative of the IC be present in India for chasing up Indo-US business alliance. The TEST agreement also does not envisage IC doing business in India, but had envisaged their assisting ICICI-TG in USA.

Issue - 3

Missing and hence no reply

Issue - 4

ICICI-TG is surprised to find such a remark emanating from the interview. Though Mr. N. Chandramouli, GM of MIL had visited ICICI-TG and learnt about the activities of TEST, in a very long session, he has indicated his ignorance about TEST activities for reasons best known to him.

As already indicated, ICICI-TG travels to various cities and meets potential clients and promotes both TA and loan proposals. It also briefs all the procedures to be followed and conditions for availing assistance under the Programme. Any third party located in India and bringing proposals will not be able to achieve the requirements for financing under TEST. We don't agree that the presence of a full-time technical assistant would have helped this deal to conclude as SI had independently contracted Tata Risk Management Services for following up on such leads.

Issue - 5

ICICI-TG has no comments on SI's tracking system. As regards ICICI-TG, periodic reminder letters are sent followed up with telephone/visits. Based on the feedback, the proposals are followed or closed as the case may be.

National Productivity Council (NPC)

TEST Activities NPC representative participated in two tours arranged by USAEP/TEST.

Issue

As early as September 1993, ICICI-TG obtained the views of S.P. Chandak, Director, NPC, at the loan sanctioning meeting where TTG's proposal discussed. ICICI-TG is also in regular touch with NPC, for possible collaboration in development of environmental business sector, with US technologies. NPC, Mumbai, officers have made use of the library created by ICICI-TG for reference. At present, ICICI-TG has an application from NPC, for a grant. This is for information.

Shreyans Industries Limited (SIL)

Being an end-user, SIL does not require any TA.

Issue - 2

On advice of ICICI-TG, APML approached Shreyans and some other prospective agro based paper mills, who in the opinion of ICICI-TG, were capable of undertaking such a risky investment proposal. With this lead and conditional grant assurance from TEST, it was easy for APML, to persuade SIL to avail assistance under TEST.

ICICI would like to clarify that both, existing Indo-US and newly formed alliances qualify for funding and there is no restriction that only new TA assisted units should be funded.

Small Industries Development Bank of India (SIDBI)

TEST envisages creation of environmental service providers (either small/medium/ large) who are capable of selling their products/services anywhere in India including units located in industrial clusters. In the past, ICICI-TG has assisted Ventair a smaller unit with TA and Tour grant for concluding tie-up with Beltran USA. They are awaiting release of formal order from the prospective customer for availing financing under TEST. Similarly, very recently, ICICI-TG has also assisted another unit Aerotech Engineers with TA and Tour grant and is awaiting conclusion of the business deal in USA, for financing for themselves or their first customer. The other smaller engineering companies availing TA are also listed in Appendix 10 of the draft report. Therefore, it cannot be said that TEST needs more than one agency to provide loan financing.

TTG Industries Limited (TTG)

Issue - 1

TTG is one of the first two proposals to be sanctioned under TEST Programme. TTG approached ICICI-TG based on the promotional seminar held at Madras in June 1993. Again it would not be correct to state, that Indo-US tie-up without TA, should not be considered by TEST and ICICI-TG should develop new proposals for financing only with TA. Because of effective focused marketing efforts from ICICI-TG, this proposal could be funded. It may be mentioned here that TTG was also a small engineering company at the time of sanction.

Issue - 2

TTG is aware of availability of TA under TEST. However, being a specialised engineering company in the field of metallurgical industries, TTG is aware of the leading technology vendors all over the world and hence did not seek any TA. However, Mr. A. Sharrif, Technical Director of TTG has indicated that the company would be approaching TEST for TA for diversifying their activities in the field of water pollution after successful commissioning of the present 'Sterlite' contract under execution with TEST funding.

Technology Transfer Association (TTA)

Issue

As already mentioned during the Interview with Mr. Gharpure, ICICI-TG has advised his organisation to strengthen itself both financially and technically. He has also been suggested to broaden the governing body to give it an all India character. ICICI-TG is studying the growth of TTA and a formal decision will be taken at the appropriate time for providing financial assistance, based on the merits of the case.

Varun India Limited (VIL)

TEST Activities

VIL is one of the earliest proposals received by ICICI-TG for TA even before SI was contracted. ICICI-TG advised the then Interim Co-ordinator (IMCC) to provide TA. Subsequently, SI took over this early lead to complete the balance TA leading to collaboration agreement. After vigorous follow-up, ICICI-TG could persuade VIL's management to take up the project in a Limited Company and avail assistance under TEST. Our files will show the follow-up efforts taken to bring this Indo-US relationship, one of the early birds of TEST, to become reality.

Issues

ICICI-TG does not agree with the view that TEST was not responsible for creating the collaboration with Pneumafil. SI will be able to reconfirm our reply.

Issue- 1

It appears from the write-ups of the report that all the sanctioned finance proposals have been questioned by the reviewing team for some reason or the other. ICICI-TG would like to reiterate that the object of TEST is to assist creation of Indo-US environmental business sector either and/or by TA/Loans. There its no restriction that TEST should finance only TA assisted proposals. In reality, VIL got assistance mainly because it was assisted under TA and not otherwise.

Issue - 2

Prevention of air pollution is the issue and VIL's proposal envisages abatement of air pollution with the installation of Air Filters produced under Indo-US alliance and therefore deserves financing.

Issue - 3

The subject of environmental protection involves use of clean inputs, cleaner manufacturing process, reuse/recycle/recovery of unused inputs and treatment/disposal of effluent generated. Identification/monitoring/analysis/consultancy are also related activities. Therefore any proposal falling within the ambit of this basic requirement and meeting TEST funding criteria deserves support. Therefore, ICICI-TG does not agree with the observation made.

Ventair Pvt Limited

No comments

Vimta Labs

Issue

ICICI-TG promoted this TA proposal and understands from its latest annual report that Vimta is in the process of obtaining certificate for Good Laboratory Practice (GLP) from USFDA and expand its environmental activities thereafter.

World Bank

The officials in the World Bank Head Quarters in Washington D.C. are aware of the TEST Programme and ICICI - TG chief along with Sl's representative had meetings during his visit to USA in 1993 as also the visit of the former. TEST had developed a proposal under TA (Cyanoclean with IT Corporation) for disposal of Hazardous waste through incineration and the same is pending commercialisation. Further the applicant has agreed to avail funding under TEST, for purchase of Technology from USA and balance funding under World Bank line.

Issues

It is the view of ICICI-TG that, USAID decided to focus on creation of environmental business sector, on account of the smaller quantum of grant fund agreed to be provided by them during the five year life of the programme. Also, it may be inferred from the Project report that the team was aware of the activities undertaken by central/state governments, and other agencies with international funding for minimising/eliminating environmental degradation and decided not to venture into those areas where others are actively involved. Even today, TEST is the only programme funded by multilateral/bilateral agreements for creation of environmental services sector. In the event of scope of TEST being modified totally, and loan financing is eliminated for creation of services sector, Indian Environmental Business Sector may not be able to join hand with their US counterpart in larger numbers and offer US technology based products/services. Further, all these transactions will be in Dollars, resulting in heavy pressure on Rupee-Dollar exchange parity rates.

Appendix 4

INTERNATIONAL PROGRAMMES OF ASSISTANCE IN ENVIRONMENTAL SERVICES AND TECHNOLOGIES

INTERNATIONAL PROGRAMMES OF ASSISTANCE IN ENVIRONMENTAL SERVICES & TECHNOLOGIES

In broad terms, the annual flow of funds for environmental projects from bilateral and multilateral sources is at a level of $ 1 billion. Bulk of this amount (about 85 per cent) is accounted for by the environmental components of social, agricultural, health and urban infrastructure related projects. Only about $ 150 million are invested in cleaner technology, prevention and control of industrial pollution and institutional strengthening for environmental management.

India has received assistance in the environmental sector from bilateral and multilateral sources. Germany, Japan, Netherlands, Norway, United Kingdom, United States of America, EEC, UNESCO, WHO and the World Bank have already provided such assistance. Others including Australia, Canada, Denmark, New Zealand, Russia, Sweden, Switzerland, Nordic Fund, UNDP and UNIDO are in various stages of considering the proposals for assistance.

Technological need, demand for foreign exchange, development priorities and the expertise of the assisting agency seem to be the main criteria for seeking external assistance, while bilateral relations, market potential, commitment for the environmental sector and logistics seem to be the main factors for giving assistance. The policy of economic liberalisation progressively extended by the Government of India during the last five years has certainly enhanced the initiatives in the environmental and industrial sectors.

UNDP has helped in the coordination of the programmes for assistance by the various external donors and funding agencies through quarterly interaction with all of them.

Attached is a summary showing, agency-wise, the scope of the various programmes of external assistance which are significant in the field of environmental services and technologies.

SUMMARY OF PROGRAMMES OF EXTERNAL ASSISTANCE IN ENVIRONMENTAL SERVICES AND TECHNOLOGIES

Bilateral Agencies

Australia :	Industrial pollution control
Canada :	Environmental management; Bio-gas; Eco-restoration of lake; Locale-specific environmental education
Denmark :	Environmental master plan
Germany :	Strengthening of pollution control laboratories; Industrial pollution control; Energy conservation
Japan :	Yamuna Action Plan; Environmental planning, management and training; Industrial pollution control
Netherlands:	Industrial counselling for pollution control in the tanneries and fertilizer and paper industries; Training in environmental impact assessment, biomonitoring and ecotoxicology; Strengthening of Kerala State Pollution Control Board; Utilisation and disposal of fly ash
New Zealand:	Management of coastal areas and corals; Research for CFC substitutes
Norway :	Dispersion and movement of pollutants; pollution monitoring in aluminium industry
Russia :	Environmental mapping; Geographical information system;
Sweden :	Environmental Protection Training and Research Institute; Hazardous waste management; Pollution abatement in paper mills
Switzerland:	Treatment of tannery wastes; Management of energy and environment in glass industry;
U.K. :	Ganga Action Plan; CFC substitute study; Ash disposal; Environmental control of Madras waterways; Urban environment improvement plan for Delhi and Calcutta; Dispersion of air pollutants; Environmental management plan of a mine
U.S.A. :	Alternative energy resources development; Environmental management plan of a coal field; Awareness for environmental management; Trade in Environmental Services and Technologies; US-Asia Environmental Partnership Program

Multilateral Agencies

ADB	:	Energy efficiency; Industrial pollution control
EU	:	Watershed management; Rehabilitation of land
Nordic Fund	:	Industrial pollution control in small and medium industries
UNDP	:	Environmental Action Programme of India; Environmental Education Centre; Common effluent treatment plant for a cluster of tanneries; Bio-energy from industrial, municipal and agricultural wastes; An implementing agency under the Global Environment Facility, Montreal Protocol and Capacity 21
UNESCO	:	Support to seminars and workshops
UNIDO	:	Processing industrial waste from sponge iron plant; Treatment of tannery effluent; Atmospheric dispersion modelling; National Cleaner Production Centre; Recovery and recycling of CFC refrigerants; Phasing out of ODS in unorganised sector
World Bank	:	Reduction of gas flaring; Industrial pollution control (including common effluent treatment plants); Cement Industry Restructuring; Power Utilities Efficiency Improvement; Renewable Resource Development; Cleaner Technologies Promotion Network
WHO	:	Safety and control of toxic chemicals and pollutants; Training in water and air pollution control; Urban air quality monitoring and modelling; Noise control

Appendix 5

SIGNIFICANCE FOR THE TEST PROJECT OF ENVIRONMENTAL REGULATORY MEASURES

SIGNIFICANCE FOR THE TEST PROJECT OF ENVIRONMENTAL REGULATORY MEASURES

The Constitution of India directs the State to endeavour for protection and improvement of the environment and for safeguarding the forest and wildlife of the country. In the pre-independence enactments also, there are provisions for protection of air and water quality and for action against committing public nuisance. More recently, by amendments to old legislation or by new enactments, environmental matters have been widely covered.

The environmental laws that are particularly relevant in their application to the operations of the industries are the following:

a. The Water (Prevention and Control of Pollution) Act, 1974
b. The Air (Prevention and Control of Pollution) Act, 1981
c. The Environment (Protection) Act, 1986
d. The Forest (Protection) Act, 1980
e. The Water (Prevention and Control of Pollution) Cess Act, 1977
f. The Public Liability Insurance Act, 1991
g. The National Environment Tribunal Act, 1995

The Water Act and the Air Act are the core of the laws for controlling pollution. There is one board each at the Centre and all the States for implementing the Water Act, the Air Act and the Water Cess Act. Certain functions, such as control of handling and disposal of hazardous wastes have been assigned to the pollution control boards under the Environment Protection Act.

The purpose of the Public Liability Insurance Act and the National Environment Tribunal Act is to provide immediate relief to persons affected by accident that occurs while any hazardous substance or waste is being handled or disposed of.

To establish a new industrial unit, environmental issues have to be addressed since the inception of the project. The Ministry of Environment and Forests of the Government of India has issued environmental guidelines for various kinds of projects and also a notification requiring submission of environmental impact assessment of development projects.

Consent of the State Pollution Control Board has to be sought under the Water Act and the Air Act to establish a new industrial unit that may pollute environment. The local authority and the State departments of environment and industry also look into environmental aspects, among others, to accord clearance for such projects. After the plant is installed, consent to operate has to be sought under the Water and Air Acts from the State Board. In the performance of its functions, the State Board has power to make an application to the courts for restraining apprehended pollution of water and/or air and also to direct the closure, prohibition or regulation of any industry, operation or process, or the stoppage or regulation of supply of electricity, water or any other service. Under the Environment (Protection) Act, the Central Government also has such power for closure of industry and stoppage of service, and the Central Government has delegated such power to the State Governments. The potential dichotomy between the Environment Act and the Water and Air Acts is avoided by a provision in the Environment Act to the effect that where any act or omission constitutes an offence punishable under the Environment Act and any other Act then the offender found guilty shall be liable to be punished under the other Act.

The Central Government has prescribed a proforma for submitting an environmental statement annually to the State Pollution Control Board. The statement is in the nature of a rudimentary environmental audit. The Central Government has also issued rules, regulations and various standards under the Environment Protection Act.

The Central Pollution Control Board has specified the water quality for the best designated use and set standards for ambient air quality and noise. The Central Board has also evolved minimal national standards stating limits to which pollutants may be permitted in the trade effluent and have set emission regulations for air pollution control. Additional emission and effluent standards are prescribed by the concerned State Pollution Control Board. In prescribing the standards, the State Board is guided by those evolved by the Central Board and those notified by the Central Government under the Environment (Protection) Act.

The environmental laws and the rules and regulations have been going through a process of evolution. When they were framed, adequate data

were not available. Environmental laws and standards have been progressively implemented and rationalised through the establishment of environmental information centres by the Ministry of Environment and Forests, internalisation of environmental concerns in the various ministries and government agencies, interaction with bilateral and multi-lateral assisting agencies, collection of data from monitoring network for water and air quality, information furnished in the environmental impact assessment reports, in the applications for seeking consent to establish or operate and in the annual environmental statements, and the knowledge built up by research and academic institutions. At times, revision may mean a stricter standard than what existed earlier or inclusion of new parameters.

New standards based on consumption of resources and on quantity rather than concentration of pollutants have been issued in some cases. Standards for emission of noise and odour may be prescribed in due course. Monitoring may be more elaborately prescribed, requiring more frequent if not continuous recording of emission and effluent characteristics. Heavy metals may have to be monitored to assess their movement into ground water, retention on soil and uptake by crops grown on fields to which fly ash is applied for agricultural purposes.

A cess related to air pollution, similar to the Water Cess, may be evolved or a comprehensive charge may be evolved covering environmental pollution.

During the last decade, a noteworthy feature of the pollution control scenario in India is the emergence of public interest litigation in environmental matters. Since such cases are filed at the highest level and the court has taken a firm view and promptly issued its directions, the impact has been deep and wide in forcing the industrial establishments to pay attention to pollution control measures and in building up the effectiveness of regulatory agencies.

The media have given good coverage to the directions of the courts. Other activities carried out by the pollution control boards, professional institutions and non-governmental organisations have also helped generate awareness in the society against pollution and environmental degradation. The awareness is reflected by the increase in

the number of public complaints, notices for intention to prosecute and questions raised in the parliament and state assemblies.

Many industries (especially older, medium- and small-scale industries) are mainly driven by the fear of administrative or legal action against violation of prescribed standards. Therefore, any improvement short of meeting the prescribed standards does not give security against such actions. A technology that can improve existing environmental performance but not meet the standards does not convince the industry, even if it is financially attractive. For the same reason, a technology that can achieve much better results than the prescribed standards also does not attract as it would imply avoidable investment. In this context, the entrepreneur still has a tendency to regard the investment in pollution control as separate from the investment needed for establishing the industrial unit or modernising it to achieve higher productivity, reduced dependence on labour, reliability in operation and assurance of quality. While, in general, the awareness has been built up in the society,

Among these industries, TEST is benefitted by the awareness created by the actions of the regulatory authorities and the higher levels of judiciary in India. The surge in the demand for pollution control equipment and monitoring instruments in India provides a good opportunity for TEST to introduce environmental services and technologies from the United States.

Appendix 6

MARKET FOR ENVIRONMENTAL SERVICES AND TECHNOLOGIES

MARKET FOR ENVIRONMENTAL SERVICES AND TECHNOLOGIES

OVERVIEW

The demand for environmental services and technologies has steadily grown since the start of the TEST project at a rate of 25 to 30 per cent per annum. Key factors include improvement in enforcement of environmental standards, successive court orders for upgrading or closure of polluting industrial units, increase in the number and scope of public interest litigation in matters related to environmental degradation, certain fiscal incentives for pollution control and the way industrial activity and competition were spurred by economic liberalisation.

In 1991, a market survey was sponsored by USAID, New Delhi, for the proposed project for Trade in Environmental Services and Technology (TEST) in India. The survey showed that the demand for American technology was already high and was likely to grow rapidly. Purchase of machinery was estimated at US $ 135 million per annum of which a portion of about US $ 6 million was imported from the United States of America. The total amount assessed for the pollution control industry was about US $ 220 million in 1990. In 1993, USFCS/India observed that the most promising sectors for the market in pollution control equipment, in a descending order, were air pollution, water pollution, dust collection and purification systems, industrial waste control equipment and solid waste management, and gas emission control equipment.

In 1995, the Confederation of Indian Industry prepared a report for TEST on the Environmental Management and Business Opportunities in India, which included an assessment of the size of the environmental market. The report showed that the market had increased to the level of US $ 1,776 million by 1994, and the projected figure for the year 2000 was US $ 4,000 million.

Even up to 1993, India was not within the top ten largest import markets of pollution control equipment. During 1993-1995, India just entered the list of top ten fastest growing total markets with an

average annual growth rate of 23 per cent.[1] On a 1 through 5 scale used to indicate trade-related factors showing more favourable conditions with higher number, the International Trade Administration of USDOC rated India for fiscal year 1994 as 4 for receptivity, 3 for local competition, 2 for third-country competition, and 3 for market barriers. This assessment also indicates that special attention will have to be given to competition with other developed countries keen to capture Indian market.

India's current spending on environmental protection is barely 0.3 per cent of the GNP compared with 1.3 per cent by the developed countries. The present low rate of investment in relation to GNP is indicative of the scope for increase in investment in future. As the industrial activity will grow and try to gain market, the demand for environmental management will grow even faster because the market, external assistance sources and other driving forces are favouring quality control and environment friendliness and there is a large backlog to be cleared.

In just a few years, a large number of industrial units have secured certification for quality assurance under the ISO 9000 series and beginning from this year, about 6 units have secured certification for environmental management system under ISO 14000 series. The Indian industry has taken much interest in the programmes organised by various foreign and local institutions in connection with these ISO series.

MARKET SHARE

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[1]By 1994, the Indian authorities had prepared a list of pollution control technologies needed to be imported in India (see Tables 4.2.1.1, 4.2.2.5, 4.2.4.3, 4.2.7.1 and 4.4.2 on pages 40, 48, 54, 65 and 77 of the report on Environmental Management and Business Opportunities in India prepared by CII) . This list was presented to every company or agency who wished to enter the market in India. A survey is apparently required to find which items on this list have been picked up by non-US companies and whether US is still in a position to compete with them on the basis of technology and price.

The US export of environmental protection equipment to India showed a decline from the year 1990 to 1992 but picked up thereafter. The increase in US export of such equipment to India during the last three years (1992-1995) averaged about 29 per cent per annum, increasing from 11 per cent in the first year to 71 per cent in the last year. The share of this equipment related to air, water and other segments has shown no clear trend in the various years since 1990.

By early 1996, about 150 foreign companies had entered joint venture agreements with Indian firms for manufacturing environmental protection equipment over the past three years. Of these ventures, 40 per cent were reported to be American, 21 per cent British, 17 per cent German and the remaining 22 per cent belonged to other countries.[2]

US has a leading share in the supply of environmental services and technologies. The competition for market share in this regard is intense and is likely to be even more so in future primarily, with Germany, Japan and the United Kingdom.

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[2]Incidentally, according to OECD, the US share in the production and consumption of environmental goods and services also is estimated as 40 per cent of the world's market.

Appendix 7

ICICI, "Possible Business Opportunities in the Paper Industry", internal memorandum (August 2, 1996)

Appendix 7

ICICI, "Possible Business Opportunities in the Paper Industry", Internal Memorandum (August 2, 1996)

From: MAHAJAN, G.R. /TST/SCH
To: RAGOTHAMAN S / /BZO; MUKHERJI.S /ZM/CAL; CHAND HEMA /ZM/DLL KUSRE A.T. / /MDS; JAYACHANDERA J V /ZM/BLR;SURYA MAHADEV (BRANCH MANAGER); SARMA P. J. V / /HYD; RAVISHANKER RAMAN /OPS/PNE

Subject: Possible Business Opportunities in the Paper Industry
Date: Friday, August 02, 1996 5:38PM

Under the TEST Programme implemented by the Technology Products and Services Division, we had funded a project for the recovery of caustic soda from black liquor generated by agrobased paper and pulp mill using bagasse as raw material for the first time in India. The project has been successfully commissioned and the Madras based technology supplier M/S Agro Pulping Machinery Pvt. Ltd. (APML) has secured second order for supply of similar system to M/S Simplex Paper Mills Ltd. (SPML). SPML has availed of leasing facilities from State Bank of India for Rs 10 crores to set up this facility.

It is, therefore, possible to approach the agrobased pulp and paper units (30-75 TPD pulp capacity) in your portfolio/area for setting up these caustic soda recovery facilities which not only enable the units to recover caustic soda for reuse but also take care of pollution abatement problem associated with black liquor by ensuring zero discharge of the black liquor. The mills that have the effluent treatment units in place, can also use this facility to reduce the total pollution load on the system, thereby achieving the waste disposal norms stipulated by the respective pollution control boards.

Since each such facility would cost in the vicinity of Rs 10 to 15 crores (depending on the pulp unit capacity with payback period of around 4 to 6 years), we may consider offering either seller's line of credit to APML (address: 23, 'Anu Apartments', 4th Floor, 39-B, Chevalier Shivaji Ganeshan Road, T. Nagar, Madras - 600 017. Tel 044-4340698/4491/8211; Fax 044-4345578) or providing term loan, leasing or any other appropriate means of funding to the pulp mills.

For any additional details on the technology/funded project you may contact Shri K. Harmathan, Sr. Vice President, TEST Dept. At Scindia House Ext. 5524, Tel: 022-2661371 (Dir.)

With best wishes,
P.M. Kale

Appendix 8

ICICI, TEST Programme: Eighteenth Status Report
(October 31, 1996)

Appendix 8

ICICI, TEST Programme: Eighteenth Status Report (October 31, 1996)

THE INDUSTRIAL CREDIT AND INVESTMENT CORPORATION OF INDIA LIMITED

Trade in Environmental Services & Technologies (TEST) Programme

EIGHTEENTH STATUS REPORT (AS ON OCTOBER 31, 1996)

Summary

I. LOANS AND CONDITIONAL GRANTS

(a) Cumulative Status

USAID Commitment: US $11.735 million
Reflows Available for business: Rs.8.33 million (US $0.27 million)

	Sanctions	Commitments	Disbursements	Cancellation
Number of Projects	13	9	9	1
Rupees	285.2	223.4	218.6	28.8
US Dollars (US $1 = INR 31.40)	9.1	7.1	7.0	0.9

(details given in Annexure 1)

(b) Active Applications on Hand

Number of Projects	8
Estimated Project Cost (Cumulative) - Rupees in Million	1124
Assistance Sought - (Cumulative) - Rupees in Million (inclusive of - Dollar Loan requests)	181

(details given in Annexure 2A)

117

(c) Active Pipeline Enquiries

Number of Projects	8
Estimated Project Cost (Cumulative) - Rupees in Million	368
Assistance Sought - (Cumulative) - Rupees in Million (inclusive of - Dollar Loan requests)	140

(details given in Annexure 2B)

II. TECHNICAL ASSISTANCE

		Up to June 30, 1996	July 01, 1996 to October 31, 1996	Cancellation
a	**Enquiries**	710	71	781
b	**Sanders International**			
	Proposals forwarded	55	2	57
	Action initiated	48	2	50
	TA under Progress	9	0	9
	Completed	6	1	7
c	**T&I Tours**			
	Indian to US			
	- Under TEST	3 tours (19 delegates)	1 tour (8 delegatges)	4 tours (27 delegates)
	- Under USAEP/TEST Combined	15 tours (30 delegates)	1 tour (3 delegates)	16 tours (33 delegates)

d. Information Network

Information Centre with E-Mail and fax facilities created at Scindia House, 5th Floor. Most of the reference material so far received/procured codified and kept on display/use.

A CD-ROM facility has also been installed to refer to various databases available on CDs at the centre.

Internet connectin made available for TEST Group. A visit fo IT officials from ICICI organised ot USA for discussions with venders for putting up a server at ICICI-TEST Group. Necessary applications to VSNL and MTNL submitted.

III. GRANTS TO ASSOCIATIONS/PROFESSIONAL BODIES

The policy note for selecting the proposals and sanction of amount finalized. The first grant of Rs 10 lacs awarded to Ahmedabad Textile Industry's Research Associaiton, Ahmedabad for setting up online information centre on enviornmental technologies. The first installment of Rs 5 lacs disbursed.

We have received proposals seeking Rs 8.7 million in the form of grants.

Details given in Annexure 3.

THE INDUSTRUIAL CREDIT AND INVESTMENT CORPORATION OF INDIA LIMITED

Trade in Environmental Services and Technologies (TEST) Programme

Annexure 3

Grants to Associations/Professional Bodies
(As on October 31, 1996)

Sr No.	Active Pipeline Enquiries	Assistance requested for (Rs. million)
1	The Associated Chamber of Commerce and Industry, New Delhi	1.4
2	Technology Transfer Association, Mumbai	0.6
3	Ahmedabad Textile Industry Research Association, Ahmedabad	2.2
3	National Productivity Council, New Delhi	1.8
4	FICCI, New Delhi	8.5
	Total	**8.5**

Sr No.	Grantee	Grant Amount
1	Ahmedabad Textile Industry Research Association, Ahmedabad	1.0
	Total	**1.0**

THE INDUSTRIAL CREDIT AND INVESTMENT CORPORATION OF INDIA LIMITED

Trade in Environmental Services and Technologies (TEST) Programme

Qualitative review -- Loans and Conditional Grants
(As on October 31, 1996)

		NOS
I	**ORIGIN OF APPLICATIONS**	
Through	- Promotion	9
	- TA	4
II	**TYPE OF ASSISTANCE PROVIDED**	
	- FX Only	3
	- Rupee Only	6
	- Mixed	4
III	**NATURE OF ASSISTANCE**	
	Term Loans	12
	Conditional Grants	1
IV	**PURPOSE OF ASSISTANCE**	
a.	- Clean Technology	1
	- Pollution Prevention	4
	- Pollution Treatment/Abatement	7
	- Services	1
b.	- Own Use	4
	- For Manufacture of Products	8
	- Consultancy/Services	1
V	**TYPES OF INDO-US BUSINESS**	
	Licensing	7
	Joint Venture	3
	Commodies/Services	3

VI REGION-WISE SANCTIONS

Northern	4
Southern	6
Western	2
Eastern	1

VII PROPOSALS SANCTIONED

No.:	13 (FX $2.6 million + Rs.204.5 million)

VIII DISBURSED TO CLIENTS

US $7.0 million (Rs.218.6 million)

IX HOST COUNTRY CONTRIBUTION

- Actuals	75%
- (Envisaged)	35%

X REFLOWS RECEIVED

	(Rs. lacs)
- Interest	332
- Principal Repayment	137
- Total	469

THE INDUSTRIAL CREDIT AND INVESTMENT CORPORATION OF INDIA LIMITED

Trade in Environmental Services and Technologies (TEST) Programme

Review of Activities
(As on October 31, 1996)

I	**SOURCING OF FINANCING**	
	a. Direct Financing	Yes
	b. Through TA	Yes
II	**TYPE OF ASSISTANCE**	
	a. Term Loan	Yes
	b. Conditional Grant	Yes
III	**NATURE OF ASSISTANCE**	
	a. FE	Yes
	b. RL	Yes
IV(A)	**PURPOSE OF ASSISTANCE**	
	a. Clean Business	Yes
	b. Pollution Prevention	Yes
	c. Pollution Treatment	Yes
IV (B)	**PURPOSE OF ASSISTANCE**	
	a. Own Use	Yes
	b. For Manufacturing	Yes
	c. Consultancy	Yes
	d. Services	Yes

V	**ASSISTANCE FOR PURCHASE OF**	
	a. Technology	Yes
	b. Services	Yes
	c. Commodies	Yes
VI	**TYPE OF INDO-US BUSINESS**	
	a. Licensing	Yes
	b. Joint Venture	Yes
VII	**REGION WISE SANCTIONS**	
	a. Eastern India	Yes
	b. Western India	Yes
	c. Northern India	Yes
	d. Southern India	Yes
VIII	**NO. OF PROPOSALS SANCTIONED**	13 (FX $2.6 million + Rs.204.5 million)
IX	**FUNDS DISBURSED TO CLIENTS**	U.S. $7.0 million (Rs.218.6 million)

THE INDUSTRIAL CREDIT AND INVESTMENT CORPORATION OF INDIA LIMITED

Trade in Environmental Services and Technologies (TEST) Programme

Annexure 1 A

Loans/Conditional Grants
(List of Sanctions as on October 31, 1996)

Sr. No.	Name of the Company/Location	Name of US Collaborator/Location	Pollution Activity*	Purpose of Assistance	Date of Sanction	Project Cost	Sanctioned Assistance		Remarks
						Rs.	FE	RL	
1	Kirloskar AAF Limited (formerly Kirloskar SnyderGeneral Corpn.) Bangalore	SnyderGeneral Corpn. Kentucky	PT	To set up facilities for the manufacture of an Air Pollution Control Systems.	01/09/93	89	5	50	Term Loan
2	TTG Industries Limited Madras	Davy Mckee Corpn. California	PT	Acquisition of technology for removal of pollutant gases.	01/09/93	15.5	9.2	0	Term Loan
3	Shreyans Industries Limited Ahmedgarh Punjab	Enders Process Equipment Corpn. Illinois	PP/PA	To set up facilities for disposal of pulp mill black liquor effluent from Agro based paper mills through caustic soda recovery.	10/06/94	17.9	8.3	53.2	Term Loan/ Conditional Grant
4	The Association Cement Companies Limited Thane, Mumbai	Research Cottrell New Jersey	PS	To acquire technology and equipment to set up air flow model testing facilities for the manufacture of air pollution equipment.	16/08/94	17.9	8.4	3.2	Term Loan
5*	Ignifluid Boilers India Limited Madras	Tampella Power Corpn. Georgia	PP/PA	Acquisition of Technology and Equipment for the manufacture of low No_x/So_x circulating fluidsed boilers, flue gas scrubbers, advanced.	27/09/94	44.5	28.8	0	Term Loan

Sr. No.	Name of the Company/Location	Name of US Collaborator/Location	Pollution Activity*	Purpose of Assistance	Date of Sanction	Project Cost	Sanctioned Assistance		Remarks
						Rs.	FE	RL	
6	D.I. Filter Systems Pvt. Ltd. Gurgaon	Donaldson Inc., Minnesota	PP/PA	To set up plant for the manufacture of Air Filters for Gas Turbines.	27/09/94	33	0	15	Term Loan
7	Gabriel India Limited Parwanoo	Pfaudler Corporation, New York	PA/PT	To set up facilities for recovery of heavy metals and recycling of process water from electroplating waste.	28/03/95	10.3	5.3	1.3	Term Loan
8	Varun India Limited Jaipur	Pneumafil Corporation North Carolina	PP/PA	To set up a plant for the manufacture of gas turbine air intake filters and air filter elements.	21/06/95	19.1	0	12.4	Term Loan
9	TTG Industries Limited Madras	Joy Environmental Technical Inc. Texas & SWEMCO Inc. New York	PT	Acquisition of Technology to manufacture gas cleaning systems for smelters.	21/06/95	169.4	17	0	Term Loan
10	Kothari Sugars and Chemicals Limited Kattur, Trichy Dist.	Amcane International Inc., Minnesota	PP/CM	To set up cane separation system for sugar mill.	22/02/96	221.6	0	35	Term Loan including Rs.185 lac sanctioned out of reflows
11	Kirloskar AAF Limited Bangalore	Engineering Mechanics Research Corporation, Michigan	PT	To acquire software for air flow modelling for manufacture of air pollution equipment.	10/09/96	3.3	0	2.9	Term Loan
12	Hydraulic & General Engineers Limited, Mumbai	UEM Inc. Florida	PT	To purchase equipment for biogas mixing in Anaerobic sludge digester.	10/09/96	290		22.5	Term Loan

Sr. No.	Name of the Company/Location	Name of US Collaborator/Location	Pollution Activity#	Purpose of Assistance	Date of Sanction	Project Cost	Sanctioned Assistance		Remarks
						Rs.	FE	RL	
13	Madhya Bharat Papers Limited Calcutta	Purification Industries International, Kansas Power Marketing International, Inc. California	PT	To set up facilities for disposal of agrobased pulp mill black liquor through biomethanation route.	29/10/96	14		9	
					Total	**945.5**	**82**	**204.5**	
								286.5	

* Since Cancelled

\# PA → Pollution Abatement
PP → Pollution Prevention
PT → Pollution Treatment
PS → Pollution Services
CM → Cleaning Manufacturing Process

THE INDUSTRIAL CREDIT AND INVESTMENT CORPORATION OF INDIA LIMITED

Trade in Environmental Services and Technologies (TEST) Programme

Annexure 2 A

Active Applications in Hand
(As on October 31, 1996)
(US $ & Rs. in Million)

Sr. No.	Category	Name of the Applicant	U.S. Callaborator	Cost of Project	Loan Application	Remarks
1	B	Advance Waste Mgmt. Pvt. Limited Hyderabad	Search Inc. Oklahoma	Rs.90	Rs.30	Setting up common solid and hazardous waste treatment and disposal facilities
2	B	I.W. Technologies (India) Pvt. Ltd., Pune (Joint Venture)	I.W. Technologies Inc., Carlsbad, California	Rs.130	$0.2 FE only	Ultrafiltration and reverse osmosis for industrial waste water treatment.
3	C	Nuchem Limited Faridabad, Haryana	Radian Corporation Austin, Texas	Rs.35	Rs.13 FE - $0.40	Setting up pilot scale treatability study facilities for industrial wastewater.
4	C	Netel Chromatographs (Universal Ferro & Alloys), Mumbai	Polybac Corporation Bethlehem, Pennsy.	Rs.26	$ 0.41 FE Only	Acquisition of technology to manufacture equipments for Industrial wastewater treatment.
5	C	Delta Paper Mills Bhimavaram, Andhra Pradesh	M.T.C.I., California (through - Esvin Advanced Technologies, Madras)	Rs.170	Rs.30 FE $ 0.5	Caustic soda recovery from Ricestraw based black liquor for paper & pulp mill.
6	C	Cynoclean Company Pvt. Ltd. Madras	I.T. Corporation Tenn.	Rs.650	$ 1.5 FE Only	Setting up common treatment facility for hazardous wastes incineration.
7	C	Essar Risk Management Mumbai	Environmental Elem. Corporation Alaska	Rs.8.5	$ 0.13 FE Only	Acquisition of technology for environmental data communication system for on-line monitoring.

Total Project Cost : Rs1104.5 M (US $ 35.2 Million)
TEST Assistance Sought : Rs.172M (US $ 5.5 Million)

A → awaiting sanction
B → appraisal under progress
C → proposal received and processing to commence

Fluid air expected by 01.11.96 for US $ 336,000/EID PArry to revert to Monsanto project for Rs.450L

THE INDUSTRIAL CREDIT AND INVESTMENT CORPORATION OF INDIA LIMITED

Trade in Environmental Services and Technologies (TEST) Programme

Annexure 1 B

Commitments
(As on October 31, 1996)

Sr. No.	Name of the Company	FX (Dollars)	Rupees (in million)	Total (Rs. in million)	Security
1	TTG Industries Limited	292,000 (Eqv. Rs.9.3m)	0	9.3	Second Charge on all assets and Pledge of Shares by promoters.
2	Kirloskar AAF Limited (formerly - Kirloskar SnyderGeneral Limited)	158261 (Eqv. Rs.5.0 m)	50	55	Mortgage & Hypothecation
3	Shreyans Industries Limited	263,209 (Eqv. Rs.8.3 m)	53.2	61.5	Exclusive hypothecation of project assets.
4	D.I. Filter Systems Pvt. Limited	---	15	15	Mortgage & Hypothecation
5	The ACC Limited	263,000 (Eqv. Rs.8.4 m)	3.2	11.6	Hypothecation on pari-passu basis.
6	Gabriel India Limited	162,000 (Eqv. Rs.5.3 m)	1.3	6.6	Exclusive hypothecation of project assets.
7	TTG Industries Limited	530,000 (Eqv. Rs.17 m)	0	17	Second Charge on all assets and Pledge of Shares by promoters.
8	Varun India Limited	---	12.4	12.4	Mortgage & Hypothecation.
9	Kothari Sugars & Chemicals Ltd.	---	35	35	Hypothecation on pari-passu basis.
		1,668,470	**170.1**	**223.4**	

THE INDUSTRIAL CREDIT AND INVESTMENT CORPORATION OF INDIA LIMITED

Trade in Environmental Services and Technologies (TEST) Programme

Annexure 2 B

Pipeline
(As on October 31, 1996)
(US $ & Rs. in Million)

Sr. No.	Name of the Applicant	U.S. Callaborator	Cost of Project	Loan Application	Remarks
1	F. Harley & Company (P) Ltd. Calcutta	Negotiations underway for Collaboration	Approx. $ 1	Approx. $0.5 FE & RL	Air Pollution Control equipments for gas cleaning.
2	Premier Irrigation (P) Limited Calcutta	Martin Marietta Magnesia Specialities Baltimore, Maryland	Approx. $ 2	Approx. $ 0.5 FE & RL	Dust suppression technology for coal mines, cement plants, power plants.
3	ION Exchange (I) Limited Bombay	Kosch Membranes Inc.	$ 1	$ 0.3 FE Only	Membrane technology for Industrial wastewater treatment.
4	Pradushan Control (P) Limited Jamshedpur	United Emissions Catalyst, North Carolina	Approx. $ 1	Approx. $ 0.5 FE & RL	Setting up facilities for manufacture of catalytic convertors for automobiles.
5	Prestine Environtech Limited Bangalore	A to Z Environmental Inc. New Jersey	Approx. $ 2	Approx. $ 1	Setting up facilities for manufacture of air pollution control equipments.
6	Exogen Biosystems Private Limited, Pune	Synosis Inc. New Jersey	Approx. $ 3 (6 projects)	Approx. $ 0.75 FE Only	Adaptation of biotechnology for industrial wastewater treatment in distilleries, dyestuff, chemicals, rayon, engineering sectors.
7	Indian subsidiary under formation	CSK Engineered Solutions, New York	Approx. $ 0.75	Approx. $ 0.5	Setting up facilities for industrial wastewater treatment systems designed and execution of turnkey projects.
8	Fluid Air (India) Pvt. Mumbai	Envirocare International, California	Approx. $ 1	Approx. $ 0.4	Acquisition of technology for emission gas conditioning system.

Total Project Cost : Rs.368 M (US $ 11.75 Million)
TEST Assistance Sought : Rs.140 M (US $ 4.5 Million)

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THE INDUSTRIAL CREDIT AND INVESTMENT CORPORATION OF INDIA LIMITED

Trade in Environmental Services and Technologies (TEST) Programme

Annexure 1 C

Disbursements
(As on October 31, 1996)

(Rs. in million)

Name of the Company	(US Dollars)	Rupees (in million)	Total (Rs. in million)
TTG Industries Limited	291,567	---	9.2
Kirloskar AAF Limited (formerly - Kirloskar SnyderGeneral Limited)	89,044	50	53.2
Shreyans Industries Limited	223,393	53.2	60.3
D.I. Filter Systems	---	15	15
Gabriel India Limited	162,000	1.3	6.6
The ACC Limited	152,000	3.2	8
TTG Industries Limited	463,853	---	15.5
Varun India Limited	---	12	12
Kothari Sugars & Chemicals Ltd.	---	35	35
	1,489,857 (Eqv. Rs.48.9)	**169.7**	**218.6**

THE INDUSTRIAL CREDIT AND INVESTMENT CORPORATION OF INDIA LIMITED

Trade in Environmental Services and Technologies (TEST) Programme

Nature of Indo-US Business Linkages
(As on October 31, 1996)

	INDIAN COMPANY	U.S. PARTNER	TYPE OF INDO-US LINKAGES	BENEFICIARY INDUSTRIES
	POLLUTION PREVENTION			
1	Agro Pulping Machinery (P) Ltd., Chennai	Enders Process Equipment Corporation, Illinois	Technology Transfer (Knowhow Fees + Royalty on sales)	Agrobased pulp/paper manufacturing
2	D.I. Filter Systems Limited, New Delhi	Donaldson Company Inc., Minnesota	Joint Venture (Indian 49%: US 51%)	Power
3	Ignifluid Boilers India Limited, Chennai	Tampella Power Corporation, Georgia	Technology Transfer (Knowhow fees)	Engineering
4	Varun India Limited, Jaipur	Pneumafil Corporation, North Carolina	Technology Transfer (Knowhow Fees + Royalty on sales)	Power
5	Amcane Praj (I) Limited, Pune	Amcane International Inc., Minnesota	Joint Venture (Indian 49%: US 51%)	Sugar, Agrobased pulp/paper manufacturing, Distillery
	POLLUTION TREATMENT/ABATEMENT			
6	Gabriel India Limited, parwanoo (H.P.)	Pfaudler Inc., New York	Commodity Purchase	Electroplating
7	Kirloskar -- AAF Limited, Bangalore	AAF International Inc. (formerly Snyder General Corporation), Kentucky	Joint Venture (50:50)	Metallurgical, Cement, Power, Engineering
8	TTG Industries Limited, Chennai	Davy McKee Corporation, California	Technology Transfer (Knowhow Fees + Royalty on sales)	Metallurgical

	INDIAN COMPANY	U.S. PARTNER	TYPE OF INDO-US LINKAGES	BENEFICIARY INDUSTRIES
9	TTG Industries Limited, Chennai	SWEMCO Inc., New York	Technology Transfer (Knowhow Fees + Royalty on sales)	Metallurgical
		Joy Environmental Technologies Inc., Texas	Purchase of design and drawings on case basis	
10	Kirloskar AAF Limited, Bangalore	Engineering Mechanics Research Corporation, Michigan	Purchase of design	Metallurgical, Cement, Power, Engineering
11	Hydraulic & General Engineers Limited, Mumbai	UEM Inc., Florida	Technology Transfer on case to case basis	Domestic wste, Industrial wastewaters
12	Cicion Environment Technologies (P) Limited, Bhopal	Power Marketing International Inc., California and Purification Industries International Kansas	Technology Transfer (Knowhow Fees + Royalty on sales)	Pulp and Paper, Distillery, Pharmaceutical, Any high strength industrial wastewater
		SERVICES		
13	The ACC Limited, Mumbai	Research Cottrell Companies Inc., New Jersey	Technology Transfer (Knowhow Fees + Royalty on sales)	Cement, Power, Metallurgical

THE INDUSTRIAL CREDIT AND INVESTMENT CORPORATION OF INDIA LIMITED

Trade in Environmental Services and Technologies (TEST) Programme

Impact of Programme
(As on October 31, 1996)

	INDIAN COMPANY	U.S. PARTNER	POLLUTANT	BENEFICIARY INDUSTRIES
		POLLUTION PREVENTION		
1	Agro Pulping Machinery (P) Ltd., Chennai	Enders Process Equipment Corporation, Illinois	Water	Agrobased pulp/paper manufacturing
2	D.I. Filter Systems Limited, New Delhi	Donaldson Company Inc., Minnesota	Air	Power
3	Ignifluid Boilers India Limited, Chennai	Tampella Power Corporation, Georgia	Air	Engineering
4	Varun India Limited, Jaipur	Pneumafil Corporation, North Carolina	Air	Power
5	Amcane Praj (I) Limited, Pune	Amcane International Inc., Minnesota	Water/Solid Waste	Sugar, Agrobased pulp/paper manufacturing, Distillery
		POLLUTION TREATMENT/ABATEMENT		
6	Gabriel India Limited, parwanoo (H.P.)	Pfaudler Inc., New York	Water	Electroplating
7	Kirloskar -- AAF Limited, Bangalore	AAF International Inc. (formerly Snyder General Corporation), Kentucky	Air	Metallurgical, Cement, Power, Engineering
8	TTG Industries Limited, Chennai	Davy McKee Corporation, California	Air	Metallurgical
9	TTG Industries Limited, Chennai	SWEMCO Inc., New York & Joy Environmental Technologies Inc., Texas	Air	Metallurgical
10	Kirloskar AAF Limited, Bangalore	Engineering Mechanics Research Corporation, Michigan	Air	Metallurgical, Cement, Power, Engineering
11	Hydraulic & General Engineers Limited, Mumbai	UEM Inc., Florida	Water	Domestic wste, Industrial wastewaters

	INDIAN COMPANY	U.S. PARTNER	POLLUTANT	BENEFICIARY INDUSTRIES
12	Cicion Environment Technologies (P) Limited, Bhopal	Power Marketing International Inc., California and Purification Industries International Kansas	Water	Pulp and Paper, Distillery, Pharmaceutical, Any high strength industrial wastewater
	SERVICES			
13	The ACC Limited, Mumbai	Research Cottrell Companies Inc., New Jersey	Air	Cement, Power, Metallurgical

Appendix 9

ICICI, <u>TEST PROGRAMME: List of Applications Rejected</u> (11/21/96)

Appendix 9

ICICI, TEST PROGRAMME: List of Applications Rejected (11/21/96)

TEST PROGRAMME
LIST OF APPLICATIONS REJECTED

COMPANY	PURPOSE	REASONS FOR REJECTION
AGRO PULP MACHINERY (P) LTD.	TO MFG EQPT FOR RECOVERY OF CAUSTIC SODA FROM AGRO BASED PULP MILL BLACK LIQUOR	FIRST END USER FUNDED. HENCE APLN NOT PROCESSED.
E.I.D. PARRY (INDIA) LTD.	TESTING OF NEEM BASED PESTICIDES IN USA FOR EPA CERTIFICATION.	PROPOSAL REJECTED AS IT WAS IN CONFLICT WITH USAID POLICIES.
ESVIN ADVANCED TECHNOLOGIES LTD.	TO MANUFACTURE CAUSTIC SODA RECOVERY PLANTS FROM RICE STRAW BASED PAPER MILL BLACK LIQUOR.	APPLICANT AGREED FOR FUNDING THE FIRST CUSTOMER, INSTEAD OF HIMSELF.
FORTUNE BIO-TECH LIMITED	FOR AVAILING SERVICES OF U.S. AGENCIES/LABORATORIES FOR OBTAINING CERTIFICATION FOR ECO-FRIENDLY NEEM BASED PESTICIDES.	PROPOSAL REJECTED AS IT WAS IN CONFLICT WITH USAID POLICIES.
GUJARAT HEAVY CHEMICALS LTD.	PURCHASE OF ESP FROM INDIAN VENDOR.	PROPOSAL REJECTED AS INDO US LINKAGE NOT ESTABLISHED.
HORIZON BATTER TECHNOLOGY INDIA	PURCHASE OF ENVIRONMENTAL FRIENDLY LEAD FREE BATTERIES FOR ADOPTION BY INDIAN INDUSTRIAL MATERIAL HANDLING VEHICLES.	PROMOTERS APPROACHING OTHER USAID PROGRAMMES FOR FUNDING.
INALSA LTD.	FOR MANUFACTURE OF AIR INTAKE FILTERS FOR GAS TURBINES.	ASSISTANCE SANCTIONED UNDER A GROUP COMPANY.
KINETICS TECHNOLOGY INDIA LTD.	PURCHASE OF DUAL FUEL ENGINE FOR BIO GAS UTILISATION.	REJECTED AS NO DIRECT INDO US LINKAGE ESTABLISHED.
METROCHEM INDUSTRIES LTD.	TO SET UP EFFLUENT TREATMENT PLANT.	REJECTED AS NO INDO US LINKAGE.
PREMIER ZIBA (INDIA) PVT. LTD.	IMPORT OF MICROBES AND THEIR USE FOR ADAPTABILITY STUDIES FOR INDUSTRIAL WASTE WATER TREATMENT.	STRAINED RELATIONSHIP WITH BANKER FOR AVAILING WORKING CAPITAL.

COMPANY	PURPOSE	REASONS FOR REJECTION
SIV INDUSTRIES LTD.	FOR PURCHASE OF MICROBES AND RELATED EQPT FOR EFFLUENT COLOUR REMOVAL.	INITIAL LAB SCALE TRIAL UNSUCCESSFUL. APPLN WITHDRAWN.
VARUN ENTERPRISES	FOR MFG OF AIR INTAKE FILTERS FOR GAS TURBINES.	ASSISTANCE SANCTIONED DER A GROUP COMPANY.

Appendix 10

Sanders International, Spread Sheet on TEST Technical Assistance Cases (November 7, 1996)

Appendix 10

Sanders International, Spread Sheet on TEST Assistance Cases (November 7, 1996)

TEST CASES

Test Start Date	Indian Company	Product/Tech. Sought	U.S. Partner	TA Level	Exch-Fnde	# Partic.	Status of TEST Case	Action Required	Contacts for Further Info.
January 1995	Aero-Tech Engineers	Air pollution control technology	Misonix, Warren Engineering Bayliss Technologies	5	NA	NA	Exchange to tale place in November-December 1996	AEP will receive final approval & arrange exchange	Mr. Chakrabarti, Aeor-tech E. Harwit, SI
June 1995	Agra Iron Founders Assoc.-X (and other Indian foundries)	Air pollution equip. for foundrie Also sand reclamation	EPR, Ogawa, RTP, MSI	5	AEP/TEST	14	See MIL entry, pushing for agreem	Continue follow-up w/EPR,MIL	F. Renkowicz, JHallett, SI
Dec 94	Alpro Associates	Distillery waste emphas. water reuse	None	1			SI sent TSR & Cost estimate 3/95	ICICI Action -- No response. Presume closed.	E. Harwit, SI
Dec 94	Ankleshwar Industrial Estate Consortium/represented by United Phosphorus-x	Integrated waste treatment complex	Weston International	5	AEP/TEST	2	These two companies are collaborating in the developing of an integrated waste treatment comples, pending WB support.	Mission to follow-up with Ministry of Environment re approval of funding for Masterplan	J. Hallet, SI Bart Bhatla, Weston International Mr. Panjwani, United Phosphorus
Dec 94	Artech Labs	Environmental Instrumentation	None	1	NA	NA	SI sent TSR & cost estimate 3/95	ICICI Action. No response, Presume closed.	S. Ganguli, SI

*NOTE: TA Level is noted by numbers 1-5, where 1 is lowest level of technical assistance provided by Sanders Intl.; 5 is the highest. The middle columns show who funded envir. business exchanges between the U.S. and India and number of participants. "x" indicates a joint TEST/USAEP activity.

Test Start Date	Indian Company	Product/Tech. Sought	U.S. Partner	TA Level	Exch-Fnde	# Partic.	Status of TEST Case	Action Required	Contacts for Further Info.
Dec 94	Aruna Sugars/Triveni Engineer	BOD Treatment Distillery Waste	Various-Zimpro, Pollution Control Engineering	3	NA	NA	Recv'd performance guarantees from US companies and sent to ICICI 2/95.	ICICI Action. No Response. Presumed not interested to proceed.	E. Harwit, SI
Summer 93	The Associated Cement Companies Ltd.	Flow modeling and testing lab	Research Cottrell	1	NA	NA	Loan sanctioned 9/94. SI worked with firm on other technology search for air pollution control	No action.	J. Hallett, SI
Spring 94	The Associated Chambers of Commerce & Industry of India-X	Grant application for establishment of environ. info center in new Delhi	No U.S. partner	2	AEP/TEST	1	ICICI evaluating grant request Presume will not be granted.	ICICI action.	J. Hallett, SI
Aug. 93	Agro Pulping Machinery Ltd.-X	Water pollution control equipment	Enders Process-X Equipment Also Ab.sorb & EPR	5	AEP/TEST	4	Loan sanctioned 8/94 w/Enders Project commissioned June 1996 Operating commercially.	Workshop at Ludhiana to promote success of project, Nov. 96 Working on EPR and Ab.sorb	Joe Enders E. Harwit, J. Hallett, SI Jack Wallace, Ab.sorb
Spring 94	Andrew Yule & Co.	Water pollution control equipment	Kinetic Recovery EEG Environmental	4	NA	NA	Met with Andrew Yule in Calcutta 2/95, discussed other interest in air pollution control diversification. Later company reorderailed effor.	SI contacted several companies. So far, no interest in working with distressed state firm.	Mr. G. Ganguli, Gen'l Manager, Dr. Reinhardt, Kinetic Recovery J. Hallet, C. Elff, SI
Spring 95	Aqua Bird Water Treatment Co.	Membrane/ultrafiltration, electrodialysis systems	None	2	NA	NA	Sent revised TSR outline and cost estimate 3/95. No response. Presumed no interest.	ICICI Action	Parkar Ahmed E. Harwit, SI

*NOTE: TA Level is noted by numbers 1-5, where 1 is lowest level of technical assistance provided by Sanders Intl.; 5 is the highest. The middle columns show who funded envir. business exchanges between the U.S. and India and number of participants. "x" indicates a joint TEST/USAEP activity.

Test Start Date	Indian Company	Product/Tech. Sought	U.S. Partner	TA Level	Exch-Fnde	# Partic.	Status of TEST Case	Action Required	Contacts for Further Info.
Spring 94	Bajaj Motors	Electronic emissions control device	Lean Power-X	3	AEP/TEST	3	Lean Power is negotiating an agreement to install and test the firms electronic emissions control device on Bajaj motor cycles.	No action.	J. Hallett, SI
Fall 93	Balmer Lawrie & Co., Ltd.	Wastewater Treatment technol	None	1	NA	NA	No responses to inquiries. Presume no interest.	ICICI action	K. Harinathan, ICICI
Fall 93 & Summer 96	Batliboi Int'l Ltd./HGE	Various water pollution control technologies	Various U.S. companies from TSR reports	3	NA	NA	Currently evaluating SI report on U.S. wastewater treatment firms	ICICI Action	A.V. Rao S. Ganguli, E. Harwit, SI
July 94	Biosystems India	Distribution of bio-augmentation product, eventual investment planned	Biosystems U.S.A.	2	NA	NA	Demo at South India Viscose failed due to need for additional ox in water treatment ponds. Probably closed.	ICICI Action	Dr. P. Mehta J. Hallett, SI
Fall 93	Biotech Envirocare Systems Pvt., Ltd.	Floating aerators WWT equipment	None	1	NA	NA	Company lost interest in pursuing oppor., presume closed.	None	K. Harinathan, ICICI
May 96	Biotech Consortium of India, Ltd.	Bioremediation of hydrocarbon contaminated soil	Industrial EcoSystems (IES)-X	5	TEST	1	BCIL has developed opportunity with Oil and Natural Gas Corp. to do demo. Seeking Indian comml firm to execute demo with possibly Nuchem	SI to follow up with IES	J. Wilson, IES J. Hallet, SI S. Ganguli, SI
Fall 93	Cadilla Laboratories, Ltd.	General Interest in the TEST program	None	1	NA	NA	Indian firm did not respond to TA offers	None	K. Harinathan, ICICI
Fall 96	Central Pollution Control Board - X	Technical Assistance in writing Envir. legislation	U.U. EPA	4	AEP/TEST	1	TEST will follow-up with both sides as part of haz. waste deleg followup	SI, EPA and NPCB action	S. Ganguli, SI Mr. Verma, Biswas, NPCB
Fall 93	Cethar Vessels Ltd.	General TEST interest on various technologies	None	1	NA	NA	Indian firm did not respond to TA offers	None	K. Harinathan, ICICI

*NOTE: TA Level is noted by numbers 1-5, where 1 is lowest level of technical assistance provided by Sanders Intl.; 5 is the highest. The middle columns show who funded envir. business exchanges between the U.S. and India and number of participants. "x" indicates a joint TEST/USAEP activity.

Test Start Date	Indian Company	Product/Tech. Sought	U.S. Partner	TA Level	Exch-Fnde	# Partic.	Status of TEST Case	Action Required	Contacts for Further Info.
Aug 93	Cyno Clean - X	Hazardous waste treatment plant	International Technology Corp. & Fuller KCP	5	AEP/TEST	4	Pending completion of EIA for current site. Missed deadline for WB financing. Delayed indefinitely.	ICICI Action	Alan Baker, IT Corp.; Brian Field, Fuller, KCP; B. Ravi, Pure Tech; J. Hallett, E. Harwit S. Ganguli, SI
Spring 94	Delta Paper Mills, Ltd.	Effluent gasification	MTCI/Thermochem-X	3	AEP/TEST	2	TA provided; awaiting proposal to ICICI. Problems with gasification technology.	ICICI Action	J. Hallett, SI
January 95	Din & Gray Consultants Pvt. Ltd.	Training for EIA & EA	None	1	NA	NA	Indian firm did not respond to req for clarification and focus of TA request.	ICICI Action/ follow-up	Girish P. Dingre J. Hallett, SI
Nov 93	Dyna-K Automotive Catalytic Stampings - X	Metal monoliths for catalytic converters	Metreon Car Sound Exhaust Systems Metal Methods	5	AEP/TEST	2	Dias visited May 95. Trip report received June 95. Focus shifted to CATS for two wheelers. Summer 96 - Dias shelves project.	Metreon is evaluating their substrates for the 2-wheel market; Metal Methods is on hold for the substrate techology.	Dyna-K; C.F. Dias E. Harwit, SI
Fall 93	Econ Pollution Control Pvt. Ltd.	EIA HW Consult	None	1	NA	NA	After initial contract, no TA request submitted. Probably closed.	ICICI action	A.K. Sahu, Econ J. Hallett, SI
Fall 93	E.I.D. parry	Environmental consulting	None	1	NA	NA	Closed July 94	None	K. Harinathan, ICICI

*NOTE: TA Level is noted by numbers 1-5, where 1 is lowest level of technical assistance provided by Sanders Intl.; 5 is the highest. The middle columns show who funded envir. business exchanges between the U.S. and India and number of participants. "x" indicates a joint TEST/USAEP activity.

Test Start Date	Indian Company	Product/Tech. Sought	U.S. Partner	TA Level	Exch-Fnde	# Partic.	Status of TEST Case	Action Required	Contacts for Further Info.
Dec 94 & Fall 96	Electronic Corp. of India, Ltd.-X	Env. Monitoring for air and water pollution controls	Ogawa Royce Instruments Monitor Labs	5	AEP/TEST	2	Sent TSR & CE 1/95 Business exchange resulted in agreements with 3-4 firms	Awaiting completion of demo of Ogawa passive air monitors at Agr. Follow-up with other U.S. firms	SAIC-Ajay Chada Mr. Gopalakrishnan, ECIL E. Harwit, SI
Jan 94	Enkem Engineers Pvt. Ltd.	Seeking partnership with U.S. firm to help build low-cost WWT facilities	Talking to Barrett Consulting: Barrett has expressed interest & has sent bid materials to bid on an Indian plant.	3	NA	NA	Barrett and Enkem are jointly bidding on ADB projects	No action; Barrett will keep us informed.	Barrett Consulting: Macros Lopez or Frank Barrett; Enkem Engineering: Mr. Subramani E. Harwitt, SI
Spring 94	Enviro Clean Systems Ltd.	Requested general info on TEST only	None	1	NA	NA	No TA request from Indian firm after initial contact. Closed.	None	Venkata Naryanan, Enviroclean.
Spring 95	Esvin Technology	Effluent Gasification	MTCI	3	NA	NA	See Delta Paper Mills entry	None	K. Harinathan, ICICI
January 95	Exogen	Joint venture established to further develop and market bioreactor systems.	Synosys-X (formerly named 3i Systems)	5	TEST	2	Exogen is currently working with an Indian venture capital group to raise funds for the full scale commercialization of the technology in India.	SI to follow up with Synosys	R. Dattar, M. Vasudevan, Sysnsys J. Hallett, S. Ganguli, SI

*NOTE: TA Level is noted by numbers 1-5, where 1 is lowest level of technical assistance provided by Sanders Intl.; 5 is the highest. The middle columns show who funded envir. business exchanges between the U.S. and India and number of participants. "x" indicates a joint TEST/USAEP activity.

Test Start Date	Indian Company	Product/Tech. Sought	U.S. Partner	TA Level	Exch-Fnde	# Partic.	Status of TEST Case	Action Required	Contacts for Further Info.
Spring 94	F. Harley & Co., Pvt. Ltd. - X	Air pollution control equipment	E.E.R. Energy & Environmental Research Born Environmental	4	AEP/TEST	1	EER and Born no longer interested as of fall '95. Sastry retired. No further interest in pursuing project from F. Harley.	No action.	F. Harley: Dr. Sastry; E.E.R.: Bair Folsom in CA office Born: Sidney Born
Spring 95	The Fertilisers & Chemicals Travancore Ltd.	Waste water treatment technologies	Siegmund Environmental and other U.S. firms	2	NA	NA	Initial interest in package wastewater plants. U.S. firms not interested, feel Indian firm lacks adequate exper. to develop technology.	None	E. Harwitt, SI
Fall 93	FACOR	Liquid waste absorbent technology for oil and tannery indust.	Ab.sorb-X	4	AEP/TEST	1	Signed MOU but unwilling to put money into demo and commercialization. Closed.	Follow-up re other Indian firms with interest: Agro-Pulping and Southern Allow Foundries	Jack Wallace: Absorb E. Harwitt, SI
Spring 94	Fine Hydrochem	TEST inquiry only	None	1	NA	NA	No request for TA made after initial contact.	None	K. Harinanthan, ICICI
Fall 94	Fortune Bio-tech Ltd. (Andra Pradesh)	U.S. Laboratory Services and Eco-friendly pesticides.	Technology Sciences Group (Washington)	2	NA	NA	Financing proposal submitted stages if approval 1/95 submitted rept on TSG credentials	Project considered unqualified for TEST support because not related to industrial pollution	J. Hallett, SI
Fall 93	Gabriel India, Ltd.	Vacuum evaporation system for recovery and recycling of heavy metals from electroplating wastewater.	Pfaudler, Inc.	1	NA	NA	ICICI financed this deal with a loan of $200,000 for the total project cost of $300,000	No action	Howard Hartley, Pfaudler K. Harinathan, ICICI

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Test Start Date	Indian Company	Product/Tech. Sought	U.S. Partner	TA Level	Exch-Fnde	# Partic.	Status of TEST Case	Action Required	Contacts for Further Info.
Spring 94	Grindwell Norton Ltd.	Requested TEST Info. only	None	1	NA	NA	No request for TA made after initial contact	No action	K. Harinanthan, ICICI
Spring 94	H.B. Consultants & Engineers Pvt. Ltd.	Requested TEST Info. only	None	1	NA	NA	No request for TA made after initial contact	None	Mr. Ramarathnam, HB Consultants
November 93	Hindustan Electronics	Air Monitoring Devices	K3-X	4	AEP/TEST	1	Met with a number of interested Indian firms, but technology is too advanced for Indian at present.	Closed-No Action	Chris Kudranac, K3 J. Hallett, SI
July 94	Hindustan Organic Chemicals, Ltd.	Water pollution equipment	Aquachem Enviro Systems TF Purifier	3	NA	NA	3/95: received subcontractors response to HOCL questions, sent to ICICI	ICICI Action	C. Eiff, SI
Dec 94	Jost's Engineering	Paint VOC/Sludge	None	2	NA	NA	2/95 sent TSR estimate	ICICI action	E. Harwit, SI
Spring 94	Horizon Batteries	Electric Battery for Vehicles	Technologies, Inc. (Texas)	1	NA	NA	Proposal submitted for financing	ICICI action	K. Harinathan, ICICI
Fall 93	Humphreys & Glasgow Consultants Pvt. Ltd.	Gen. Engineering Consultants	Jacobs Engineering Group (Californinia)	2	NA	NA	US JV partner contacted. Not interested to receive TA or other assistance from TEST	ICICI to follow up with Indian Indian joint-venture of Jacobs Engineering	S. Ganguli, SI
Spring 94	Ignifluid Boilers India Ltd. - X	Air Pollution Control Equipment	Tampella Power Corp.; Detroit Stoker; also looking at Castone for Fly Ash Uses	5	AEP/TEST	2	Loan sanctioned 9/94. Loan never drawn, financing withheld by ICICI in early 1996.	Closed	Ignifluit Boilers: Mr. Rao; Tampella Power Corp: Mr. Patel
Fall 95	Indocan Engg	Wastewater Treatment thru Production of Ferric Chloride	PVS Chemicals	3	NA	NA	Fall 96 meeting in Bombay`	Followed-up with PVS in Oct. 96. Waiting for response from PVS.	C. Eiff, SI D. Rutkowski, PVS Chemicals

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Test Start Date	Indian Company	Product/Tech. Sought	U.S. Partner	TA Level	Exch-Fnde	# Partic.	Status of TEST Case	Action Required	Contacts for Further Info.
Summer 94	Industrizl Boilers - X	Air pollution control tech; fly ash utilization technologies	Castone and other US firms	4	AEP/TEST	2	There was lengthy discussion of a MOU w/Castone, then dropped.	No Action.	J. Hallett, SI Mr. Baldawala, Ind. Boilers
Sept. 93	INALSA, New Delhi - X	Industrial air filters	Pneumafil, Charlotte, NC	5	AEP/TEST	2	Loan sanctioned in Summer 1995.	Closed.	Mr. Chatterjee, INSALA Ugo Bert, Pneumafil
Nov. 93	Ion Exchange - X	Wastewater treatment tech.	Allied Signal Modular Environmental Technology Koch Membrane Systems	4	AEP/TEST	3	Licensed membrance technology from Koch Membrane as result of TEST/USAEP business exchange. No further assistance required.	No Action.	Ion Exchange: Satish Chilekar; New Jersey Contact for Allied Signal: Brent Defeo; E. Harwit, SI
Fall 93	Jet Engineering Co.	Requested TEST info only	None	1	NA	NA	Business agreement w/MET.	Closed.	K. Harinathan, ICICI
Spring 94	J.S. Group of Companies	Water pollution equipment	None	1	NA	NA	No TA assistance requested.	Closed.	K. Harinathan, ICICI
Summer 93	Kirloskar	Air pollution equipment	American Air Filter	1	NA	NA	Loan sanctioned for a JV between the two companies.	No Action.	J. Hallett, SI Bert Grohman, AAF
Oct. 93	Larsen & Toubro	Gas station clean-up	EBW International				Met with Fluid Power in India 1993 EBW in 1995.	L&T not interested to proceed with either firm	S. Gangul, SI
	Bombay	Equipment	Fluid Power - X	3	AEP/TEST	2			
Nov. 93	Lucas-TVS Ltd.	Automotive air pollution control for India	Lean Power - X	4	AEP/TEST	2	10/96: Lean Power currently doing demos with Bajaj for 3 wheelers.	SI Follow-up with Lean Power	J. Hallett, Stephen Bryen -- Lean Power

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Nov. 93	Mantec Consultants, Pvt.	Oil recovery unit	Yankee Environ. Services - X	5	AEP/TEST	2	Sale completed to Indian Cst Guar. Field demos took place 10/96.	SI Follow-up	Christian Ling, Yankee J. Hallett, SI
Spring 94	Marathe Engineering Industries	Requested info on TEST program only	None	1	NA	NA	No TA requested after initial contact.	None	K. Harinathan, ICICI
Spring 94	McClelland Engineering Industries	Requested into. on TEST program only	None	1	NA	NA	To TA requested after initial contact.	None	K. Harinathan, ICICI
January 95	MIL Industries Ltd.	Air pollution control equip. also solvent recovery	EPR - X	5	AEP/TEST	2	Closed for solvent recovery; Negotiating with EPR on distr. agree.	Follow-up both sides.	Rajiv Sreedhar, MIL J. Hallet, SI
Aug. 93	Munradtech	Joint venture for production of industrial air filters	Donaldson, Inc.	5	NA	NA	Loan sanctioned 9/94. Operating successfully	No Action.	K. Lindquist, Donaldson S. Ganguli, SI J. Hallett, SI
Oct. 96	National Productivity Council - X	Hazardous Waste Remediation	IT Corporation	5	AEP/TEST	2	NPC is continuing discussions w/IT on hazardous waste.	SI will follow-up with both parties in November 96.	Dr. Saxena, NPC A. Baker, IT Corp.
Oct. 93	Neptune Equipment Pvt. Ltd.	Service station recovery and recycling	None	2	NA	NA	SI sent information on EBW. EBW met Neptune, not interested pursue alliance.	Probably closed.	S.P. Shah S. Ganguli, SI
Spring 94	Nilkamal Plastic and Allied Industries	Requested info. on TEST only	None	1	NA	NA	No TA request after initial contact	No Action.	K. Harinathan, ICICI

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Spring 94	Nuchem Weir, Ltd. New Delhi - X	Environmental Audits and Bioremediation Environ. Labs.	Radian Corporation and Industrial Ecosystem	4	AEP/TEST	2	Radian and Nuchem are establishing an environmental analysis unit. Also pursuing bioremed. demo with Oil and Natural Gas Corp.	SI to follow-up with IES Nuchem having financial difficulties. Unable to take TEST loan at present time. ICICI will monitor.	Dr. N. Sriram, Jack Wilson, IES J. Hallett, Mr. Barar - Mng. Dir. S. Ganguli, SI Avi Patkar, Radian
Summer 95	Paramount	Hazardous waste treatment	Clean Harbors IT Corporation	3	NA	NA	Paramount has not responded. Possible collaboration with IT Corp.	Follow-up earlier contact with Paramount re collaboration with IT Corp.	C. Eiff, SI A. Baker, IT Corp.
Summer 96	Pradushan Controls	Catalytic converters for diesel engines	United Emissions Catalysts (UEC)	4	NA	NA	Through TEST technical assistance UEC has approached the U.S. EXI Bank for assistance.	UEC considering ICICI loan request, if they decide on a real JV partnership with Pradushan.	E. Harwit, SI M. Hobbs, UEC
Spring 94	Praj Industries Ltd.	Solvent recovery Cane Cushing	Amcane	2	NA	NA	Test loan sanctioned 1996 for Praj Amcane JV	No Action.	Mr. N.S. Kunkolikar
Spring 94	Premier Ziba	Biotechnology for industrial waste-water treatment	U.S. Biotech - X	5	AEP/TEST	3	Clearances finally granted 8/96. Beginning pilot demos of product TEST likely to finance if PZ submits proposal.	ICICI followup PZ SI followup US Biotech	Mr. Govind Srivastava, Premier Ziba E. Harwit, J. Hallett, SI
Summer 96	Raj Iron Foundry	Re-engineer the foundry's coke-burning cupola to coke and gas combustion system	RTP Environmental Associates Stearns & Wheeler	5	NA	NA	Raj has commissioned these firms to do the engineering work. Both firms to travel to India in Fall, 1996.	SI follow up with RTP.	E. Harwit, SI Sunil Hangal, RTP

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Spring 95	R.J. Shah and Co. Ltd.	Air pollution control technologies	Nucon, CSM. Vara	4	NA	NA	Shah exchanging info with US firm. Moving slowly.	SI followup. ICICI followup with Shah.	C. Eiff, SI
Spring 94	Raman Boards Ltd.	Rice husk ash recovery technologies	None	2	NA	NA	Submitted tech. search outline & cost	No response, seems no interest to proceed with search.	Mr. V. Raman
Fall 93	Shriram Industries - X	Air and Waste Water Treatment technologies	None	2	AEP/TEST	1	Did not follow-up with TEST after exchange. No TA assistance requested.	ICICI follow-up	J. Hallet, SI
Spring 94	S.K. Systems Pvt. Ltd.	Requested info. on TEST only	None	1	NA	NA	No TA requested after initial contact.	Closed.	S. Ganguli, SI K. Harinathan, ICICI
Spring 94	SIV Industries Ltd.	Requested info on TEST only	None	1	NA	NA	No TA requested after initial contact.	Closed.	J. Hallet, SI
Spring 96	Solapur Chemicals	Sand reclamation technologies	Dependable Foundries, GMD, National Engineering, Kloster	5	NA	NA	AEP is receiving final approval for exchange to U.S. and travel	SI awaiting decision from USAEP	S. Ganguli, SI
Fall 94	Sudarshan Chemical Industries Ltd.	VOC recovery for rayon plant	Radian	3	NA	NA	Sudarshan refused to invest in de project, wanted 100% funding.	Closed.	Ramesh Vkidve Avi Patkar Dr. R.J. Rathi
Spring 94	Tata Consultancy Services	TEST info. requested only	None	1	NA	NA	No TA requested after initial contact.	None	K. Harinathan, ICICI
Spring 94	Tata Consultancy Services	TEST info. requested only	None	1	NA	NA	No TA requested after initial contact.	None	N.J. Patel
Spring 94	Tata Risk Management	Hazardous waste environ. impact -- risk assessment	None	2	NA	NA	No TA requested after initial contact.	None	Subir Gupta

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Test Start Date	Indian Company	Product/Tech. Sought	U.S. Partner	TA Level	Exch-Fnde	# Partic.	Status of TEST Case	Action Required	Contacts for Further Info.
Summer 94	Technology Transfer Ass'n	Computer database	No. U.S. partner	2	NA	NA	ICICI financed $300,000 of a total project cost of $500,000 to finance engineering design work.	Closed	John Sedlak, Davy Intl.
Summer 93	TTG Industries	Air pollution system for an acid plant.	Swemco Inc. and Joy Environmental Technologies, Inc.	1	NA	NA	ICICI financed $530,000 from a total project cost of $5,400,000.	Closed	Jim O'Farrel, Swemco
Spring 94	The Phosphate Co. Ltd.	Air and Water pollution control technologies	None	2	NA	NA	1/95-ICICI ask for TA estim. SI seeks clarification on request. Firm did not respond.	ICICI action.	Suresh Bangur
Summer 95	Thermax Ltd.	Hospital waste disposal	IIT (Illinois Institute of Technology) - X	5	AEP/TEST	1	MOU signed for cooperation & pending action by Thermax on sending a market assess. report.	SI followup with IIT	E. Harwit, SI Sid Firstman, IIT Dr. Joshi, Thermax
Spring 95	TIL Ltd.		Energy Systems, Utilase, Texc	5	AEP/TEST	2	After extensive TA and exchange Uniexcel has been unable or unwilling to commit.		J. Hallet, SI C. Eiff, SI S. Nagaswami
	Uniexcel Agencie & Services Pvt. Ltd. - X	Laser welding tech. for environmental filter production	MKI					ICICI will followup on TSR report and Uniexcel.	
Summer 94	Vam Organic, (also Enpro) Kinetics Technol. India, Ltd. Delhi	Water pollution processes/air pollution, VOC technology	Info. forwarded to Research Cottrell in Sept. for VOC	3	NA	NA	Research Cottrell not interested, already have Indian partner. No additional TA requested.	No Action.	Prakash Dhargalkar, Research Cottrell J. Hallet, SI

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Test Start Date	Indian Company	Product/Tech. Sought	U.S. Partner	TA Level	Exch-Fnde	# Partic.	Status of TEST Case	Action Required	Contacts for Further Info.
Summer 95	Ventair - X	Air ventilation systems other air pollution technologies	Beltran	5	AEP/TEST	1	Entered into licensing agreement with Beltran to build air pollution control system. Beltran to travel to India in Fall, 1996.	SI to followup with Beltran.	E. Harwit, SI Mr. Lokaiyan, Ventair
May 95	Vikram	Gen'l engineering resources	None	1	NA	NA	Approached Joy Environmental at their request, not interested to collab. No additional TA requested.	ICICI action.	Sumit Shah
Jan. 94	Vimta Labs Ltd. - X	Partnership with a pollution testing lab	Weston, Radian, Law	5	AEP/TEST	2	USAID/ICICI to push Vimta to identify projects for collaboration with potential partners. Vimta has yet to commit.	Vimta Exchange completed May 95. Vimta to follow up with U.S. companies. 10/96: No action from Vimta.	S.P. Vasireddi, S. Ganguli, SI
Fall 93	Voltas Ltd., Bombay	Air pollution equipment	None	2	NA	NA	Subcontractor report mailed 9/93. No response received.	Closed	D.K. Kelpure
Jan. 95 and 96	Western-Paques India, Ltd. - X	Waste management technologies	WMX, Biosystems Intl., McGill Environmental DDH Enterprises	5	AEP/TEST	1	2/95 met with EH, Business Exchange Spring 96. Possible tieup with WMX.	ICICI action. SI followup.	E. Harwil, S. Ganguli, SI

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Appendix 11

Sanders International, TEST Status Report - October 1996

Appendix 11

Sanders International, TEST Status Report (October 1996)

Trade in Environmental Services and Technologies (TEST) Status Report- October 1996

Ventures and Partnerships Formed: *The following were facilitated through technical assistance from Sanders International, often with TEST financing from the Industrial Credit and Investment Corporation of India (ICICI) and/or business exchange support from U.S.-AEP:*

1) Amcane International and Praj Industries have formed a joint venture called **Praj/Amcane** to market a sugarcane separation technology. This technology separates the outer surface of the sugarcane from the pulp. This results in reducing harmful effluents during the sugar manufacturing process. ICICI has disbursed a loan of $1 million to **Kothari Sugars** to install this technology in their manufacturing plant.

2) American Air Filter International (formerly Snyder General), Louisville, Kentucky and **Kirloskar Industries** of Pune formed a joint-venture manufacturing plant for the production of air pollution control equipment and some wastewater treatment equipment. The total plant cost was $3,000,000 of which $1,800,000 was financed by the ICICI. AAF International owns 50% of the manufacturing plant which currently has reached about $20,000,000 in annual sales.

3) Beltran, New York, New York and Ventair Private Ltd. of Madras have entered into a licensing agreement to design and build an air pollution control system for a Madras-based titanium dioxide plant. Beltran has provided the designs for a wet electro-static precipitator (ESP) system which will be built in conjunction with Ventair. Beltran is traveling to India in October, 1996 to meet with the Indian client for final approval of the ESP systems.

4) Davy International (formerly Davy McKee), San Ramon, California & **TTG Industries,** Madras: Technology transfer for the design of waterjacketed gas collection hoods from Davy International. The technology was used in two of Hindustani Copper's smelter plants. ICICI financed $300,000 of a total project cost of $500,000 to finance the engineering and design work.

5) Donaldson, Minneapolis, Minnesota and Mundradtech of New Delhi: Joint-venture for the production of gas turbine filters. ICICI financed $500,000 of a total $1,000,000 project cost. The plant opened in December, 1995 in Gurgaon, just outside of Delhi. The new JV currently has annual sales of over $4,000,000.

6) Enders Process Equipment, Glen Ellyn, Illinois and Shreyans Industries of New Delhi: Through TEST technical assistance and financing, Enders and its local representative have erected a $4,100,000 black liquor incineration and caustic soda recovery plant at Shreyans Pulp & Paper mill in Ludhiana, Punjab. The plant has successfully completed its test run and is now operating commercially. TEST provided technical assistance, U.S.-AEP supported a business exchange, and ICICI provided a conditional grant of $1,000,000 to finance the demonstration of this technology.

7) EPR, West Springfield, Massachusetts and the **Agra Iron Founders Association** (AIFA), Agra: TEST introduced EPR to the AIFA through a U.S.-AEP funded delegation visit to the U.S. The delegation traveled to the U.S. in search of technological solutions for pollution problems associated with small foundries located near the Taj Mahal. EPR has signed an agreement with the AIFA to demonstrate a low-cost air pollution technology for fine particulate collection from foundry emissions and is negotiating with a prospective Indian distributor/representative on a business linkage. TEST intends to finance the demonstration project at an Agra foundry and the start-up costs of the distribution arrangement.

8) IIT Research Institute of Chicago Illinois and **Thermax** of Mumbai: Through TEST technical assistance, these two firms are collaborating to introduce IIT's low-cost medical waste treatment technology in India. Thermax will license the IIT technology and manufacture the units in India for use by small community hospitals.

9) Industrial EcoSystems (IES), Pacifica, California and **Biotech Consortium of India, Ltd.** (BCIL): TEST introduced IES and BCIL during the 1995 TEST Biotreatrnent Delegation to India IES and BCIL have submitted a proposal for TEST/World Bank financing of a demonstration project for the bioremediation of hydrocarbon-contaminated soil for a TEST initiative aimed at promoting broader understanding and awareness of U.S. biological treatment technologies.

10) Koch Membrane Systems, Wilmington, Massachusetts and **Ion Exchange** of Bombay, India: Under a U.S.-AEP funded exchange, Ion Exchange visited the U.S. Ion Exchange signed an agreement with Koch Membrane for the distribution of thin membrane technology for wastewater treatment in pulp & paper mills in India.

11) Lean Power, College Park, Maryland and **Bajaj Motors** are negotiating an agreement to install and test the firm's electronic emissions control device on Bajaj motor cycles. Lean Power made its initial trip to India in 1994 with the help of a U.S.-AEP business exchange and TEST technical assistance.

12) Ogawa, Inc., Pompano Beach, Florida and the **Electronic Corporation of India, Ltd.** have entered into a distribution arrangement for Ogawa's Passive Air Sampler, a low-cost and highly effective ambient air monitoring device that detects sulfur dioxide and oxides of nitrogen. The relationship developed through TEST technical assistance and a U.S.-AEP funded business exchange for ECIL representatives.

13) Pfaudler Inc., Rochester, New York and **Gabriel India, Ltd.** of Pawanoo in Himachal Pradesh: Gabriel purchased a vacuum evaporation system for the recovery and recycling of heavy metals from electroplating wastewater. ICICI financed the deal with a loan of $200,000 for the total project cost of $300,000.

14) Pneumafil Corporation, Charlotte, North Carolina and **Inalsa/Varun Enterprises** of Jaipur: Through a combination of technical assistance and financing, the two companies signed a technology licensing agreement for the manufacture of air intake filters for gas turbines. ICICI financed $400,000 of a $700,000 project for the license.

15) Radian, Denver, Colorado and **Nuchem Ltd.**, of Faridabad: As a result of TEST technical assistance and U.S.-AEP business exchange support, the two firms are establishing an environmental laboratory analysis unit to service the Indian market. Radian and Nuchem are also jointly pursuing wastewater treatment projects in India.

16) Research Cottrell, Somerville, New Jersey and **Associated Cement Companies** of New Delhi: ICICI financed a licensing agreement for a flow modeling technology for gas collection equipment. The total project cost was $600,000 of which TEST financed $400,000.

17) Royce Instrument Corporation, New Orleans, Louisiana and Electronics Corporation of India Limited, Hyderabad, India, have entered into an agreeement for a marketing tie-up for marketing water quality monitoring instruments in India.

18) RTP Environmental Associates, Green Brook, New Jersey with **Stearns & Wheeler**, New York and **Raj Iron Foundry**, Agra: RTP and Steams & Wheeler are working with Raj Iron Foundry to re-engineer the foundry's coke-burning cupola to coke and gas-combustion system. Raj Iron Foundry has commissioned both firms to do the engineering work and both U.S. firms will travel to India in the fall of 1996. The project was initiated as a result of the U.S.-AEP-funded Agra Foundry Delegation Visit to the U.S. and a follow-up trip to India for RTP Environmental.

19) Swemco Inc., New York, New York & **Joy Environmental Technologies, Inc.**, Houston, Texas concluded deals with **TTG Industries** of Madras: Through a technology transfer from Swemco and a purchase of equipment from Joy, TTG was able to develop an air pollution system for an acid plant being built in India. The deal required financing for the gas cleaning system technology for the plant's gases, which was designed by Swemco. The deal also required the purchase of an electrostatic precipitator from Joy Environmental. The total project cost was $5,400,000 of which TEST financed $530,000.

20) Synosys, New Brunswick, New Jersey and **Exogen** of Pune: As a result of TEST technical assistance and its participation in the 1995 TEST Biotreatment Delegation, Synosys has established a joint venture company with Exogen, Inc. to further develop and market its innovative bioreactor wastewater treatment systems. Synosys has provided pilot-scale units to several Indian enterprises for testing which have returned excellent results in treating distillery and textile wastes. Exogen is currently working with an Indian venture capital group to raise funds for full commercialization of the technology in India.

21) United Emission Catalysts (UEC), Canton, North Carolina and **Pradushan Controls**, of India: UEC has entered into a licensing agreement with Pradushan Controls for the manufacture of certain components of catalytic converters for diesel engines. The initial order placed by Pradushan Controls was for the sale and distribution of two hundred catalytic converters for trucks and buses. With TEST technical assistance, UEC has approached the U.S. Export-Import Bank (EXIM) to finance export of the catalytic components under one of EXIM's business environmental export insurance programs. Currently, Hindustan Motors is completing testing of a UEC converter on one of their manufactured buses.

22) U.S. Biotech, Teterboro, New Jersey and **Premier Ziba** of Delhi: With TEST technical and U.S.-AEP business exchange assistance, U.S. Biotech and Premier Ziba have concluded an agreement to distribute U.S. Biotech's bio-additives for various wastewater treatment applications in India Premier Ziba has secured Indian government approval to import bio-treatment products into India and test and demonstrate the effectiveness of the microbes in India. A multi-phased program has been designed to use the biotechnology in India to ameliorate serious pollution problems caused by small scale industries such as: fish farming, distilleries and pulp & paper mills.

23) Vanaire, Louisville, Kentucky and **Ventair**, Madras jointly bid in the summer of 1996 to construct an air ventilation system for an industrial client in Madras. The two firms have agreed to form a joint venture to bid jointly on other air pollution ventilation projects. This cooperation is a result of a TEST Technology Search Report and a subsequent U.S.-AEP business exchange.

24) Roy F. Weston, Westchester, Pennsylvania and **Ankleshwar Industrial Estate Consortium** of Ankleshwar, Gujarat: Through TEST introductions and technical assistance, the Ankleshwar Industrial Estate Consortium and the Roy Weston Corporation are collaborating in the development of an integrated waste treatment complex for the heavily polluted industrial estate. The work will include a sanitary landfill, a hazardous waste incinerator and a common effluent treatment plant. A joint proposal for a masterplan/feasibility study was recently cleared by the State of Guiarat's Pollution Control Board and the Gujarat Industrial Development Corporation.

25) Yankee Environmental, Seattle, Washington and **the Indian Coast Guard**: As a result of technical assistance from the TEST program and travel sponsorship from the U.S. Asia Environmental Partnership, the Indian Coast Guard purchased two Yankee Environmental "Linductors" valued at $400,000. This technology is used for clean-up of oil spills through a vacuum & oil separation process. Yankee is currently pursuing an effort to establish a joint venture spill response company using the Linductor clean-up systems.

Appendix 12

USAID/India, Quarterly Project Financial Management Report (excerpts) (September 30, 1996)

USAID/INDIA
QUARTERLY PROJECT

FINANCIAL MANAGEMENT REPORT
VOLUME - I

AS OF SEPTEMBER 30, 1996

Issued by:
Office of the Controller
USAID/New Delhi

530: TRADE IN ENVIRONMENTAL SERVICES & TECHNOLOGIES | Project Officer: A. Ray | PACD: 09/97

FY	Obligations	COMMITMENTS Plan	Actual	Current	Cumulative*	EXPENDITURES Plan	Actual	Current	Cumulative	Pipeline	FY
Prior	4200	0	0	0	0	0	0	0	0	4200	Prior
93	2000	2010	1370	68%	22%	600	256	43%	4%	5944	93
94	1500	5441	4371	80%	75%	4788	2083	44%	30%	3794	94
95	2200	4557	2385	52%	82%	4087	3767	92%	62%	2695	95
96 -12/95		2000	-145	-7%	81%	1000	1099	110%	73%	4679	96 -12/95
-03/96	2500	1600	260	16%	66%	1900	516	27%	62%	4209	-03/96
-06/96		500	758	152%	73%	370	470	127%	66%	7041	-06/96
-09/96	3050	2000	225	11%	60%	700	218	31%	54%	8441	-09/96
PACD 9/97	5000	7000			79%	3600			59%	0	PACD 9/97
#	4550	8776			100%	12991			100%		#
TOTALS	25000	25000	9224			25000	8409				TOTALS

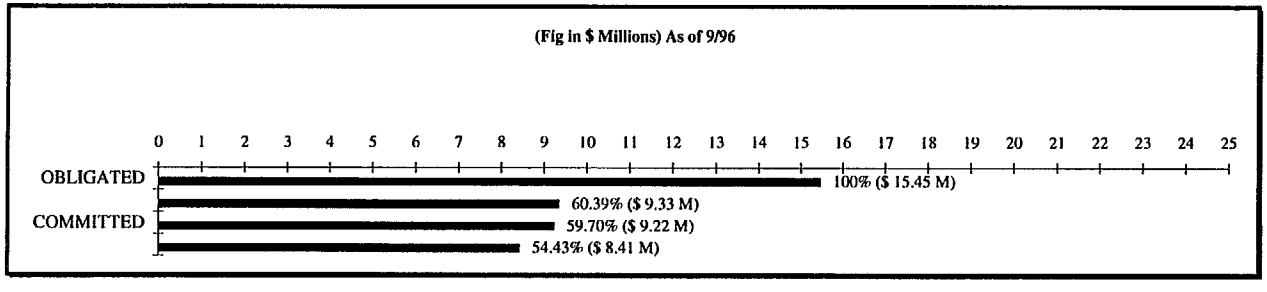
*Cumulative percentage represents ratio between the Cumulative Commitment/Expenditure and Cumulative Obligation as of a particular year.
Note: (#) A PACD extension is under consideration which may enable full utilization of the LOP funds

a) Cumulative Commitments are 70% and Cumulative Expenditures are 65% of the obligations thru the third quarter. Further, given the PACD is 9/97, the commitments and expenditures may have to be significantly accelerated to fully utilize the authorized amount. The mid-term evaluation of the project in FY 96 will consider a PACD extension, which will enable full utilization of the LOP funds.

b) Commitments are 11% and Expenditures are 31% of the plan for the fourth quarter of FY 96.

c) The audit report for the IFY 94-95 has been issued by RIG/B with no recommendations.

d) ICICI's report as of 3/95 indicates that the required host country contribution has been made.



TEST - 386-0530: FUNDING ANALYSIS AS OF SEPTEMBER 30, 1996 **PRO AG DATE: 9/92**

Element	Element No.	LOP Amount	Obligations Current	Unobligated Balance	Earmarked	Commited	Uncommitted Balance	Expenditures	Pipeline
Financing	11	20,000,000	11,735,000	8,265,000	6,525,427	6,493,827	5,241,173	6,194,465	5,540,535
Technical Assistance	12	3,645,000	3,022,000	623,000	2,405,036	2,405,036	616,964	2,032,006	989,994
Interim Coordinator	13	100,000	100,000	-	100,000	95,295	4,705	95,295	4,705
Grants to Associations	14	310,000	193,000	117,000	50,000	50,000	143,000	14,285	178,715
Support ot ICICI	15	600,000	230,000	370,000	165,000	165,000	65,000	72,192	157,808
Contingency	16	-	-	-	-	-	-	-	-
Monitoring & Evaluation	17	345,000	170,000	175,000	85,000	15,000	155,000	925	169,075
TOTAL		25,000,000	15,450,000	9,550,000	9,330,463	9,224,158	6,225,842	8,409,168	7,040,832

Commitments

	Financing	Technical Assistance	Interim Coordinator	Grants to Associations	Support to ICICI	Monitoring & Evaluation	TOTAL
Sub Project Agreements	6,493,827						6,493,827
Inst Contractor - Sanders		2,187,036					2,187,036
Inst Contractor -- IMCC - Interim			95,295				95,295
PILs		218,000		50,000	165,000	15,000	448,000
Purchase Order							-
IQC							-
TOTAL	6,493,827	2,405,036	95,295	50,000	165,000	15,000	9,224,158

CONTRACT FUNDING STATUS

	Total	Funded	Unfunded
SANDERS Cont	2217360	2187036	30324
IMCC Contract	95295	95295	0

Monthly expenditures for the last eight months

	Sanders
December 1995	48,124
January 1996	42,728
February 1996	51,951
March 1996	52,611
April 1996	52,696
May 1996	72,746
June 1996	64,066
July 1996	44,019

Expenditure

	Financing	Technical Assistance	Interim Coordinator	Grants to Associations	Support to ICICI	Monitoring & Evaluation	TOTAL
Sub Project Agreements	6,194,466						6,194,466
Inst Contractor - Sanders		1,998,427					1,998,427
Inst Contractor -- IMCC - Interim			95,295				95,295
PILs		33,579		14,285	72,192	925	120,981
TOTAL	6,194,466	2,032,006	95,295	14,285	72,192	925	8,409,169

Pipeline

	Financing	Technical Assistance	Interim Coordinator	Grants to Associations	Support to ICICI	Monitoring & Evaluation	TOTAL
Committed:							
Sub Project Agreements	299,361	-	-	-	-	-	299,361
Inst Contractor - Sanders	-	188,609	-	-	-		188,609
Inst Contractor -- IMCC - Interim	-	-	-	-	-	-	-
PILs	-	184,421	-	35,715	92,808	14,075	327,019
Total Committed	299,361	373,030	-	35,715	92,808	14,075	814,989
Earmarked	31,600	-	4,705	-	-	70,000	106,305
Unearmarked	5,209,573	616,964	-	143,000	65,000	85,000	6,119,537
TOTAL	5,540,534	989,994	4,705	178,715	157,808	169,075	7,040,831

Pipine Aging

	Financing	Technical Assistance	Interim Coordinator	Grants to Associations	Support to ICICI	Monitoring & Evaluation	TOTAL	=>Of this Un Com
1992			4,705			4,075	8,780	
1993	160,612						160,612	1,587
1994	911,189				42,808		953,997	900,000
1995	383,733	37,994					421,727	222,875
1996	4,085,000	952,000		178,715	115,000	165,000	5,495,715	4,994,964
TOTAL	5,540,534	989,994	4,705	178,715	157,808	169,075	7,040,831	6,119,426

USAID/INDIA
QUARTERLY PROJECT

FINANCIAL MANAGEMENT REPORT
VOLUME - II

AS OF SEPTEMBER 30, 1996

Issued by:
Office of the Controller
USAID/New Delhi

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COUNTRY CODE: 386
OFFICE CODE: 075 OFFICE NAME: OFFICE OF ENV, ENER. & ENTERPRISE
CURRENCY CODE: 001 CURRENCY NAME: U.S. DOLLARS

PROJECT NO./ ELEMENT NO.	PROJECT TITLE/ ELEMENT DESCRIPTION	FUND TYPE	START DT/ PACD	LIFE OF PROJ FUND	OBLIGATIONS TO DATE	EARMARKS TO DATE	COMMITMENTS TO DATE	EXPENDITURES TO DATE	PIPELINE
3860521.00	AGRI. COMMERCIALIZATION & ENTER	G	08/28/91	20,000,000	11,200,000	10,816,412	10,591,502	8,239,220	2,960,780
14	IMPLEMENTATION SUPPORT				350,000	350,000	268,264	162,560	187,440
15	EVALUATION				90,000	58,997	58,997	0	90,000
16	CONTINGENCY				0	0	0	0	0
3860530.00	TRADE IN ENV. SER. & TECHNOLOGY	G	09/30/92	25,000,000	15,450,000	9,330,463	9,224,158	8,409,168	7,040,832
11	FINANCING		09/30/97		11,735,000	6,525,427	6,493,827	6,194,465	5,540,535
12	TECHNICAL ASSISTANCE				3,022,000	2,405,036	2,405,036	2,032,006	989,994
13	INTERIM COORDINATOR				100,000	100,000	95,295	95,295	4,705
14	GRANTS TO ASSOCIATIONS				193,000	50,000	50,000	14,285	178,715
15	SUPPORT TO ICICI				230,000	165,000	165,000	72,192	157,808
16	CONTINGENCY				0	0	0	0	0
17	MONITORING & EVALUATION				170,000	85,000	15,000	925	169,075
3860534.00	GREENHOUSE GAS POLLUTION PREV.	G	04/10/95	19,000,000	18,922,000	6,198,513	6,026,469	856,712	18,065,288
11	INVESTMENTS		03/31/92		10,500,000	0	0	0	10,500,000
12	TECHNICAL ASSISTANCE				5,128,000	5,097,429	5,096,618	793,782	4,334,218
13	TRAINING				603,000	602,571	602,571	0	603,000
14	PROJECT IMPLEMENTATION				225,000	198,513	27,280	12,930	212,070
15	EVALUATION AND AUDIT				350,000	0	0	0	350,000
16	ADMINISTRATIVE AND OTHER				300,000	300,000	300,000	50,000	250,000
17	CONTINGENCY/INFLATION				1,816,000	0	0	0	1,816,000
3980249.04	PROGRAM DEVELOPMENT & SUPPORT	G	10/01/94 09/30/96	61,536	32,385	32,385	32,385	31,700	685
4990000.75	PROGRAM DEVELOPMENT & SUPPORT	G	10/01/90 09/30/95	855,309	835,827	835,827	835,827	835,827	0
4990015.00	US-ASIA ENV. PARTNERSHIP	G	10/01/93 09/30/95	493,852	493,852	493,852	493,852	493,852	0
490015.86	US-ASIA ENVIRONMENT PROJECT	G	02/10/95 09/30/97	1,950,000	1,950,000	1,950,000	1,950,000	225,386	1,724,614
9365559.00	ENVIRONMENT POLLUTION PREVENT.	G	10/01/94 09/30/95	2,900	2,900	2,900	2,900	2,900	0
	OFFICE TOTALS	>	>	>	113,361,963		87,650,063		46,758,608
	CURRENCY 001	>	>	>		89,519,950		66,603,355	
	MISSION TOTALS	>	>	>	265,105,073		204,043,071		116,717,647
	CURRENCY 001	>	>	>		207,545,200		148,387,426	

Reported Host Country and Counterpart Contributions
IN $ ' 000s
As of September 30, 1996

Project #	PACD	LOP AID	LOP HCC	Obligation AID	Obligation HCC	Accrued Expenses 09/30/96	HCC Reported	Report As of
EEE:								
PACER - 0494	08/31/97	20,000	12,000	17,500	10,650	12,066	27,939	03/31/96
CTD - 0507	06/30/98	10,000	7,450	7,300	5,438	5,734	13,323	03/31/96
PGR - 0513	09/30/97	18,700	9,250	18,300	9,250	17,530	12,660	03/31/96
EMCAT - 0517	12/31/99	27,000	9,000	17,000	5,668	12,178	3,955	03/31/96
TEST - 0530	09/30/97	25,000	10,800	15,450	6,340	8,409	25,477	03/31/95
GEP - 0534	03/31/02	19,000	87,530	18,922	87,530	857	Due, but not recd	
PHN:								
PACT-CRH- 0496	07/31/00	20,000	10,000	7,000	3,215	713	Due, but not recd	
PVOH-II - 0511	08/31/97	10,000	3,410	10,000	3,410	6,660	3,839	**
QCHT - 0514	09/30/98	13,300	23,900	5,900	15,882	2,173	11,648	03/31/96
APAC - 0525	03/31/02	10,000	7,000	2,320	1,624	331	1,696	03/31/96
IFPS - 0527	09/30/02	225,000	400,000	59,800	106,308	20,900	Due, but not recd	
OEG:								
TASP - 0515	08/31/98	20,000	6,700	17,700	5,900	15,900	11,558	RECD***
ACE - 0521	09/30/98	20,000	10,900	11,200	6,660	8,239	17,318	03/31/96
FIRE - 0531	09/30/98	20,000	7,000	11,530	4,035	6,909	Due, but not recd	
RHUDO:								
HFS - 0515	09/30/96	4,300	1,500	3,800	1,320	3,266	907	03/31/96

NOTE:

*EMCAT: Only PFC report received as of 3/31/96 and IDBI as of 3/31/95.

** In the case of PVOH-II the HCC reflected has been reported by the Project Officer as of 3/31/96, however no report has been received from MOHFW.

*** Denotes HCC of various activities for which reports have been received for varying period.

Appendix 13

USAID/India, TEST (386-0530) Control Subledger, printout provided by V. Chatterjee (November 12, 1996)

TEST (38609530) CONTROL SUBLEDGER

(Figures in '000s)

ELM#	COMMIT. DOCMNT	SUB RECIPIENT NAME	COMMITMENTS					DISBURSEMENTS		BALANCE PAYABLE	
			(RUPEE) (PART) Rs.	$ (RATE)	(FX) (EQUIV) $	FX (COMPON)	TOTAL $	(RUPEE) (PART) Rs.	(FX) (PART) $	(RUPEE) (PART) Rs.	(FX) (PART) $
11	TEST 1	T.T.G. Industries Ltd.	0.00	0.00	0.00	292.00	292.00	0.00	291.57	0.00	0.43
	TEST 2	Kirloskar AAF Ltd.	45,500.00	31.25	1,459.35	0.00	1,459.35	45,500.00	0.00	0.00	0.00
	TEST 3	Kirloskar AAF Ltd. - FX	0.00	0.00	0.00	158.261	158.26	0.00	94.29	0.00	63.97
	TEST 3	Kirloskar AAF Ltd. - RS	4,500.00	31.30	143.77	0.00	143.77	0.00	0.00	4,500.00	0.00
	TEST 4	Associated Cement Co. - RE	3,200.00	31.00	103.23		103.23	3,200.00	0.00	0.00	0.00
	TEST 5	Shreyans Industries Ltd. - Loan	38,500.00	31.23	1,232.80	0.00	1,232.80	38,500.00	0.00	0.00	0.00
	TEST 6	Shreyans Industries Ltd. - C Gran	0.00	0.00	0.00	263.21	263.21	0.00	206.74	0.00	56.47
	TEST 6	Shreyans Industries Ltd. - C Gran	14,700.00	33.00	445.45	0.00	445.45	14,700.00	0.00	0.00	0.00
	TEST 7	D.I. Filter Systems (P) Ltd.	15,000.00	31.21	480.62	0.00	480.62	15,000.00	0.00	0.00	0.00
	TEST 8	Gabriel India Ltd.	1,300.00	31.00	41.94	0.00	41.94	1,300.00	0.00	0.00	0.00
	TEST 9	Gabriel India Ltd.	0.00	0.00	0.00	162.00	162.00	0.00	161.65	0.00	0.35
	TEST 10	Associated Cement Co. - FX	0.00	0.00	0.00	263.00	263.00	0.00	261.09	0.00	1.91
	TEST 11	TTG Industries Ltd.	0.00	0.00	0.00	530.00	530.00	0.00	474.32	0.00	55.68
	TEST 12	Varun India Ltd.	12,400.00	32.00	387.50	0.00	387.50	12,000.00	0.00	400.00	0.00
	TEST 13	Kothari Sugar & Chemicals Ltd.	16,500.00	33.00	500.00	0.00	500.00	16,500.00	0.00	0.00	0.00
E/M	TEST 14	Hydraulic & General Eng. Ltd.	22,500.00	35.00	642.86	0.00	642.86	0.00	0.00	22,500.00	0.00
E/M	TEST 15	Kirloskar AAF Ltd.	2,900.00	35.00	82.86	0.00	82.86	0.00	0.00	2,900.00	0.00
		TOTALS	135,100.00		4,294.66	1,218.21	5,963.13	130,200.00	1,489.66	4,900.00	178.81

Appendix 14

POTENTIAL MEASURES FOR THE INDUSTRIAL COMPONENT OF CTI

(12/2/96)

POTENTIAL MEASURES FOR THE INDUSTRIAL COMPONENT OF CTI (CTI/I)

This table summarizes information about potential measures for CTI/I. It includes: measures that are currently part of TEST; new measures addressed in draft CTI/I documents; and additional measures recommended for CTI/I consideration. It is organized according to the four main components proposed for CTI/I.

	Misc. env'l mgmt.	**Targeted focus**	**Publ. or private sector**	**TEST status**	**Lead instn**	**Type of perf. indicator**	**Comments**
Awareness raising (leadership development, analysis & outreach, partnerships)	Yes, primarily	Possible	Both	Limited now; much more proposed for CTI/I	Inst'l contractor (IC) & USAEP	Number of activities. Linkages established or strengthened. Follow-up on participants?	This would comprise a major part of initial CTI/I activities, partly to help identify good candidates (institutions, issues, sectors) for other CTI/I components. USAEP frequently uses these tools, but there may be need for additional USAID funding, depending on number and cost of awareness raising activities.
Private environmental incentives							These would all be new additions to TEST.
Bench marking industrial environmental performance		Yes (for specific bench marks)	Private	Proposed for CTI/I	CII	Number and quality produced + rate of application	Could be linked to regulatory activities.

National infrastructure for ISO 9000 and 14000	Yes	Possible	Both	Proposed for CTI/I	IC to coordinate	Establish a national accrediting institution. Number of: certifying agencies; reciprocal recognition agreements; firms certified in specific sectors.	The focus would be on helping Indian organizations build capability to accredit and certify under the ISO 9,000 and 14,000 programs. ISO 14,000 is among the top five priorities in USAEP/India's 1996 business plan.
Supply chain management	Possib le	Yes, for specific applicati ons	Mostly private	Proposed for CTI/I	IC to coordinate	Number of trade associations with initiatives. Number of participating companies. Tangible impacts.	
Environmental reporting and disclosure	?	?	?	Proposed for CTI/I	USAEP to take initial lead	?	A U.S.-based USAEP policy specialist will make an initial visit to help survey relevant information and design this activity.

Market based instruments	Yes	Possible	Either or both	Proposed for CTI/I	CII	Appears to be proposal for a study.	There are already many existing studies about market (price-based) instruments and how they fit with quantity-based instruments, in countries at different levels of development. Any study should evaluate an existing or proposed specific application of market instruments in India (e.g., user fees for infrastructure services, such as landfills, that could cut across more than one CTI component).
Loan requirement for environmental due diligence	Yes		Both	Proposed for CTI/I (according to USAID; not in CTI/I documents)	?	Number of: banks requiring env'l due diligence for loans; complying borrowers.	
Industrial environmental management							These would all be new additions to TEST.
Industrial extension systems		Yes, to increase impact and facilitate monitoring	Private	Proposed for CTI/I	FICCI, NPC	Complete initial survey. Improved linkages of systems. Number of participating industrial facilities. Tangible impacts.	Survey existing industrial extension services in government, utilities (pollution prevention and energy efficiency), industry associations, etc. and then assist with building more effective linkages and services. Consider whether to: (1) focus initially on a particular geographic region or sector; (2) include here or elsewhere key private commercial actors, such as equipment manufacturers and process design engineering firms; (3) link this with supply chain management activities.

Sector-specific voluntary industry standards (ISO 14,001)		Yes	Private	Proposed for CTI/I	CII	Number and quality produced + rate of application	Could be linked to regulatory activities. Link with USAEP priority on ISO 14,000.
Professional & vocational human resource development	Possible	Yes, to increase impact and facilitate monitoring	Either or both	Proposed for CTI/I	IC to explore	Number of people trained; fit with other CTI/I activities; tangible impacts.	The plan is to train people working in industrial facilities. Consider: (1) to what extent this can be integrated with other CTI/I activities, such as awareness-building partnerships and preparing industrial benchmarks or sector-specific voluntary standards; (2) extending this to operators of POTWs and power plants, for integration with other CTI components; (3) whether to "train trainers."
Technology development, adaptation & transfer							To date, the activities listed below (especially loans) have comprised nearly all of TEST's activities -- whereas under CTI/I, these will a much smaller part of TEST, with lending activities probably eliminated or restricted to conditional grants for demonstration projects to test environmental and commercial viability. (Current CTI/I documents do not specifically address financing.) Will ICICI be appropriate and interested to continue serving as an advisor and GOI representative for TEST, in light of TEST's greatly reduced financing component for CTI/I?[1]

[1]How would TEST as reconfigured for CTI/I fit with ICICI's routine banking activities and priorities? Even if TEST retains a limited financing component, the amounts of money will be very small, compared to ICICI's typical lending portfolio; how does it compare to the lending portfolio of the Technical Products and Services Division? Perhaps ICICI would still be a valuable partner for USAID, in overseeing and advising on TEST and helping to ensure maximum leveraging and impact. Even so, it might not make sense for ICICI to maintain a TEST Group, to house a TEST home page, or to take the lead on other technical assistance functions.

Financing: loans	Yes	Not so far	Private	Currently the major component of TEST; not addressed in CTI/I	ICICI	Number of loans issued over life of TEST. Consider tracking borrowers' progress and multiplier effects over the life of CTI/I.	Not recommended for inclusion in CTI/I. Loan financing does not seem to have played a significant role in advancing the number of Indo-U.S. commercial transaction/Ions. None of the companies receiving TEST loans from ICICI depended on this source of financing; all Indian borrowers had other options, though not always on such attractive terms (though one company said it could get better terms from off-shore financing). Consider providing information to CTI/I clients about financing options.
Financing: conditional grants (funding to be repaid from sales if activity proves commercially successful)	Yes	Not so far	Private	Currently part of TEST, but only one cond'l grant issued. Not addressed in CTI/I, but recommend considering limited funds for demo projects.	ICICI (to date); an instn that handles smaller-scale financing may be more suitable.	Currently, number of cond'l grants issued. Consider adding: rates of repayment; tracking borrowers' progress and multiplier effects (including demos and/or info dissemination)over the life of CTI/I.	Recommend limited funding for demo projects. Largest need probably for pollution abatement technologies for small- and medium-scale industries; for maximum impact, should target suitable sectors and regions (e.g., intensity and overall impacts of pollution, availability of low cost, low maintenance technologies, sector likely to continue for substantial time in India). Need for demos of pollution prevention approaches possible but less likely, since financing is available for production improvements with environmental benefits. Grants would have to be modest in order to be able to offer more than one or two, given projected TEST budget for next two years. Proposed budget for demo of EPR air pollution abatement technology at an Agra foundry was $100,000 ($10,000 for equipment, $90,000 for engineering, T/A, etc.).

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Financing: grants to trade associations	Yes		Private	Currently part of TEST. First grants awarded recently. Grants proposed for different purpose in CTI/I (contracts with institutional partners).	ICICI (to date); would probably shift to IC under CTI/I.	Number of grants awarded. Evaluation of results.	ICICI's plan has been to support information networks, though no grants have been awarded. Current proposal for CTI/I would be to use grants as a mechanism for paying for studies and other services performed by Indian institutional collaborators, such as CII.

Internet home page & connections	Yes	Yes	Current emphasis on private, but could be both	Already prepared by SI, transfer to Indian base proposed in original TEST and for CTI/I.	ICICI and/or FICCI, in coord'n with IC	Feedback from institutional and individual users. Explore ways to structure the system so that there is some degree of automatic feedback.	To date, users almost exclusively U.S.-based. Most Indian interviewees did not know of the TEST home page and are only recently/about to be connected to the Internet. Transfer to an Indian base assumes more widespread availability of Internet in India, to individuals or via trade associations and other institutions. This appears to be a valid assumption, but usefulness will depend on proactive outreach (training and exposure for potential users, or at least their parent organizations). To what extent can/should very small institutions serve as bases for the CTI/I information network? For example, Technology Transfer Assn (TTA), a "one-man" NGO, has been discussing with ICICI a grant to establish an Internet connection/Ion for information about environmental technologies. This could be a valuable addition, but institutional sustainability requires more study.
Information networks (miscellaneous)	Yes	Yes	Could be both	Proposed for CTI/I	FICCI	Growth of networks, re information and number of participants. How to evaluate info quality and rate of use?	This should be linked to other CTI/I activities, such as extension services and voluntary industry standards. Will require proactive approach to be effective. Consider how to link databases regarding trade leads from USAEP, TEST, industry assns, and others. This is one of the issues of interest to Technology Transfer Assn. (NGO mentioned under Internet section above), whose data base is not limited to the U.S.

Dissemination of trade leads through the U.S. network	Yes	No	Mainly private, but some public	Currently part of USAEP, proposed for CTI/I	USAEP, USFCS	Number of leads. Could also: track follow-up; analyze leads over time to I.D. key sectors, trends, etc.	Analysis of trade leads to date (and into the future) could help with identifying promising markets and targets for many proposed CTI/I activities/, as well as improving USAID's ability to evaluate TEST and CTI/I impacts over time.
Confidential searches on U.S. sources of environmental services and technologies	Yes	No	All or mostly private	Currently part of TEST, unclear if proposed for CTI/I	IC	Number of searches completed. SI has tracked follow-up as much as possible. Could track significant leads over life of CTI/I.	These searches appear to have been helpful to clients and very productive in generating additional commercial exchanges. However, requesters pay only 25% of the search costs, and it is not possible to evaluate the contribution of this service to the overall market. Consider: (1) How to better integrate this activity with USAEP trade leads, in terms of service provided and shared databases; (2) whether and (if so) how this search service could become economically self-sufficient (USAEP and SI have had initial discussions about this) OR its costs could be evaluated in terms of benefits provided.
Investment tours and exchanges	Yes	No	Both	Part of TEST and USAEP, would continue under CTI/I	USAEP and TEST IC	Number of tours and exchanges; longer term impacts on recipients, improved linkages and other multipliers.	These have clearly been productive, but it is not possible to evaluate the contribution of this service to the overall market, especially since not all tours have a commercial emphasis. Recommend reviewing experience to date with funding sources and approaches. Some recipients have objected to the scheduling restrictions of international economy flights, in some cases this led USAEP/USAID to decline to fund international airfares. Need to set joint targets for USAEP and CTI/I.

Business facilitation (miscellaneous)	Yes	No	Mostly private, some public or quasi-public	Currently part of TEST and USAEP to different degrees. Unclear how much is proposed for CTI/I.	USAEP and TEST IC	Unclear. Could track: numbers; short-term results; longer term impacts on the parties, the environment, the market (with multiplier effects).	USAEP provides only limited and sporadic assistance beyond initial facilitation. (Does the creation of four regional USAEP offices in India imply a greater ability/intent to provide this type of facilitation?) In contrast, SI provides extensive facilitation, especially from the U.S. end. This has clearly been productive, but it is not possible to evaluate the contribution of this service to the overall market. More consideration needed of how much facilitation to provide under CTI/I. Follow-up (including decisions about when to stop facilitating because a transaction is not likely to proceed) will be easier with IC representation in India.

Appendix 15

DELIVERY ORDER STATEMENT OF WORK
(TEST mid-term evaluation)

ATTACHMENT 'B'

DELIVERY ORDER STATEMENT OF WORK

BACKGROUND

A. GENERAL

USAID/India wishes to carry out the mid-term evaluation of its five year bilateral Trade in Environmental Services and Technologies (TEST) Project which was authorized in September, 1992. Subsequently, the Project Agreement was signed between Government of India represented by the Department of Economic Affairs (DEA) in the Ministry of Finance, USAID/India, and the ICICI. The Project Assistance Completion Date (PACD) of TEST is 9/30/97.

The goal of the TEST project is to increase environmental protection while enhancing industrial productivity on a sustainable basis. The purpose of TEST is to assist Indian industries adopt environmentally sound practices while promoting sustainable linkages between U.S. and Indian firms. TEST helps identify technology gaps in Environmental Services and Technologies (ESTs) in India and match those gaps with technologies in which the U.S. has comparative advantages.

Indian companies and American suppliers benefit from TEST through financial incentives, marketing and promotional activities, an enhanced two way flow of information, and the development of business linkages. The Project has been designed and implemented to respond to the demands of India's emerging environmental industry, and, in so doing, strengthen their competitive growth. The end-users are the industrial customers of these firms, where the actual pollution abatement takes place.

By its PACD, TEST should have accomplished the following results:

1. Increased use of, and demand for, state-of-the-art U.S. environmental technologies/equipment and services by the Indian environmental industry and their customers.

2. Establish an information network linking U.S. suppliers and Indian users, designed to nurture Indo-US business exchanges.

3. Long term Indo-U.S. environmental business linkages.

The Mumbai based, Industrial Credit and Investment Corporation of India Limited (ICICI), the country's premier private sector developmental finance institution implements the TEST project. Sanders International (SI), a U.S. based contractor provides technical assistance and related services.

B. PROJECT RELATIONSHIP TO USAID/I PROGRAM

USAID has established a new reporting system on its programmatic results through its annual "Results Reporting and Resources Request (R4)". This documentation analyses achievements attained and how these will allow the Mission honor its commitments made for funds received from USAID/Washington in terms of approved strategic objectives and intermediate results. The TEST project contributes to the Sub-Goal - "Increase Environment Protection" and specifically supports the mission's fifth Strategic Objective (SO) - "Improved air and water quality at selected industrial sites and municipalities" and Intermediate Result (IR) - "Improved control of air and water pollution at selected industrial sites and municipalities".

The evaluation team will be provided with a copy of the R4 document and the list of indicators and their measurement in the "Program Performance Monitoring Plan (PPMP)" document.

In April 1995 the Indo-U.S. Common Agenda for the Environment (CAE) was signed by the Indian and US governments to outline key areas of common concern and reflect the intention of both governments to engage in dialogue and cooperation on approaches to meeting global and domestic environmental challenges.

The CAE establishes a program of cooperation on environmental issues, supports the Government of India's Environment Action program and envisages integration of environmental considerations for sustainable development in all areas of Indo-U.S. cooperation. The CAE has organized three focal environmental fields: Global Issues, Science and Technology, and Trade and Investment. TEST plays a major role in producing results supporting the Trade and Investment agenda.

During May 1996 a joint team comprised by several USG agencies - USAID, USAEP, USEPA and DOE conducted an assessment of India's environmental problems. This team recommended that USG programs should focus on "Clean Cities, Clean Power, and Clean Industry" in India to support the CAE. TEST is the on going project best suited to support the recommendations for the clean industry results package.

C. PROJECT IMPLEMENTATION

1. PROJECT MANAGEMENT

a. The Office of Environment, Energy and Enterprise, (E^3) is the management unit accountable to USAID/India for the delivery of TEST's expected results. It manages the project in conjunction with its ICICI partner.

b. A TEST group in the ICICI's Technology Division coordinates all activities under the TEST project.

c. Technical Assistance support is provided by Sanders International, through a full time technical coordinator, an administrative project support officer and selected short term consultants.

d. Apex business associations such as Confederation of Indian Industry (CII) and Federation of Indian Chambers of Commerce and Industry (FICCI) provide fora to address environmental concerns in collaboration with USAID.

e. Advisory Council (AC) was originally established to provide strategic guidance to the project. However, during an analysis of the role and function of the AC with ICICI it was determined that it was not cost-effective in terms of the resources required for it and expected results.

The customers of TEST mainly comprises the subgrantees of ICICI capital financing and those who benefitted from the trade/investment and the business facilitation process. The end users of the TEST project are primarily the clients of TEST's direct customers.

Additional information on TEST may be obtained on TEST home page http://www.info.usaid.gov/TEST/.

2. PROJECT FUNDING

The TEST project was authorized in September 1992 with a total Life of Project (LOP) funding of $25 million. These funds finance several activities. As of July 1, 1996, the project obligations and expenditure are $12.4 million and $7.8 million respectively (Annex I).

TEST resources are provided for:

a Loans and conditional grants ($20 million): This activity provides capital

to firms for investment in ESTs through ICICI which will increase industrial productivity and reduce pollution. Additionally, the $10.8 million Host Country Contribution (HCC) will be contributed by the clients as their share of the EST sub-projects. Conditional grants is a risk sharing mechanism used to finance pioneering demonstration projects with high market and pollution abatement potential.

b. Technical Assistance (TA), Trade and Investment (T&I) tours and Support for Information Networks ($2.38 million): TA is provided primarily for identifying competitive ESTs for industrial plants. Under the T&I tour component, Indians may travel to the U.S. or Americans may travel to India to identify suitable technologies, suppliers, or other business linkages. Firms may apply to ICICI for TA and T&I tours independent of or in conjunction with a loan or grant proposal. Support for information networks will be targeted at apex trade associations and research institutes which are already importing and distributing information on U.S. EST - related companies.

c. Support to ICICI ($0.7 million) to enhance its capacity to lend to the environmental sector after project's PACD.

d. Small Grants ($0.31 million) and TA to trade and professional organizations to strengthen their EST activities.

e. Project Monitoring, Evaluation and Audits ($0.645 million) and $1.165 million for contingency.

Although the project started in 1992, the inadequacy of funds at the crucial takeoff stage has slowed down project implementation. For example, in FY 1995 $8 million had been programmed but only $2.2 million were actually obligated for this project.

D. MID-TERM EVALUATION SCOPE

ARTICLE I - TITLE

Mid-Term Evaluation of the Trade in Environmental Services and Technologies Project (386-0530).

ARTICLE II - OBJECTIVE

Evaluate the above project in terms of relevance, effectiveness, efficiency, and

impact; draw the lessons learned; and analyze sustainability of project activities by implementing entities.

ARTICLE III - STATEMENT OF WORK

A. GENERAL

USAID/India will contract a U.S. company to conduct a mid-term evaluation of the TEST project. The Contractor shall conduct an evaluation through a team comprised by two US and one Indian specialists which meets the qualification noted below in Annex II. The contractor will submit its findings and conclusions in a report which covers the points listed below.

B. SPECIFIC

1. EFFECTIVENESS

The team shall measure project results both qualitatively as well as quantitatively. This analysis should include the following :

a Progress made towards meeting the project's stated goal/objectives. (Project's logical frame work is attached in Annex III). Identify constraints if any, in project inputs and recommend changes required to meet the project objectives.

b. Is the project accomplishing effective Indo-U.S. trade linkages?

c. What is the effectiveness of the results produced by major project elements (loans, conditional grants to firms, technical assistance, trade and investment tours, business facilitation, information networks, grants to associations, and support to ICICI)?

d. What are the roles of counterpart institutions such as ICICI and SI in providing project support?

e. How has the slowdown in USAID funding for TEST subprojects affected the implementation plans to meet the project objectives?

f. Use and resulting changes from the grants to Associations.

g. TEST networking with other USG programs (e.g. USAEP, USEPA).

h. Is the project contributing to the mission's SO/IR level indicators? (The strategic objective 5 (SO5) tree depicting relationship chart of the project with SO/IR indicators is attached in Annex IV).

2. EFFICIENCY

a. Is the project resources mix and level delivering the expected outputs in a cost effective way? Is the input level adequate (or too high/low) for the intended activity (ie. loans to subprojects, cost-sharing of technical assistance and T&I tours)?

b. How has the decision made to reduce the level of funding per sub-project affected project results?

c. The technical assistance excluded funding for a resident specialist and to provide the TA from Washington. What has been the positive/negative effect of this approach?

d What adjustments could be made to optimize the use of TEST resources for the CAE and the clean industries results package?.

3. IMPACT

a. What has been the impact of the project based on the purpose level indicators specified in the Logical Framework matrix? Do the indicators selected continue to be the adequate ones? How do these indicators reflect the project impact and its contribution to SO5/IR indicators?

b. The team will analyze the impact of Indo-U.S. collaborations in terms of number of industries adopting such improved technologies and services, the market penetration and market value of all such environmental goods and services, and end users changes on pollution levels.

4. SUSTAINABILITY

a. Analyze the potential continuation of project activities such as capital for investments in environmental firms, technical assistance (trade and investment tours, business facilitation and information networks) and services by associations after PACD?

b. Funds from TEST's loan repayments and some cost-sharing elements reflow back to ICICI. Are these reflow funds being used to continue financing TEST related activities?

c. Will the project partners continue to initiate/nurture Indo-U.S business linkages after the PACD?

d. Have TEST partners, primarily ICICI, been able to mobilize other resources to expand their environmental portfolio?

5. RELEVANCE

a. How has the Indian economic liberalization, begun four years ago, affected the original design concept of TEST project? How has the change in the policy and institutional setting affected the relevance of TEST activities and the validity of project assumptions?

b. Are the activities as proposed under the TEST project relevant to support the joint Indo - U.S. Common Agenda for the Environment (CAE)? If so, how should the project activities be modified to be more comprehensive?

c. How can TEST complement program support, mobilize and leverage resources of other USG agencies such as USAEP and USEPA and donor agencies such as World Bank, ADB etc.?

6. HOST COUNTRY CONTRIBUTION (HCC):

Evaluators will report on the adequacy and reliability of the HCC.

7. PROJECT ASSISTANCE COMPLETION DATE (PACD) EXTENSION AND EXPANSION OF SCOPE OF PROJECT.

Though TEST has been rated as highly successful in meeting its goal of increased Indo-U.S. linkages, it would be unrealistic to assume that TEST would be able to fulfill its mandate of funding 25 subprojects (over LOP) within one year's time at the present rate of obligation and expenditure.

Based on what is discussed in the background section, the team will examine the need for extension of PACD to enable TEST to meet its goal and purpose fully. In light of recommendations of the combined USG team which visited in May 1996, the evaluators also need to revisit the need for expansion of scope of the project. Both these developments need to be looked at from the point of view of the current PACD of September 30, 1997.

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ARTICLE IV - REPORTS

A. The contractor must submit a evaluation report and complete the abstract and narrative sections of the AID Evaluation Summary (AES) form in accordance with the requirement specified below upon completion of the assignment. Six days prior to departure from New Delhi the consultants must submit a draft report to USAID/India and also arrange to debrief the USAID staff and ICICI. The team leader must ensure that all comments on the draft report are incorporated and the final report submitted at completion of the assignment along with the AES, a sample copy of which is provided in Annex V.

B. USAID's required format for evaluation report is as follows:

a. Executive Summary

The executive summary should state : findings, lessons learnt and conclusions (See Annex VI for more detailed instructions.)

b. Project Identification Data Sheet (see Annex VII)

c. Table of Contents

d. Body of the Report

The body of the report should include discussions of :

i. the purpose and study questions of the evaluation;
ii. the economic, political, and social context of the project;
iii. team composition and study methods;
iv. evidence/findings of the study concerning the evaluation questions;
v. conclusions drawn from the findings; and
vi. actions to be taken to improve project performance.

e. Appendixes

Appendixes should include a copy of the evaluation scope of work, the most current Logical Framework as pertinent, a list of documents consulted, and individuals and agencies contacted. Additional appendixes may include a brief discussion of study methodology and technical topics.

ARTICLE V - RELATIONSHIPS AND RESPONSIBILITIES

The team will work under the technical directions of Mr. Felipe Manteiga, Deputy Office Director and Mr. Amitabha Ray, TEST Project Officer in the Energy, Environment and Enterprise (E^3) office. The team may also draw support from the Office of Project Design, Implementation and Training (PDIT) which coordinates all USAID evaluations. E^3 office will provide all coordination with the Government of India, ICICI and other institutions.

ARTICLE VI - PERFORMANCE PERIOD

The period of performance will be from September 23, 1996 to October 18, 1996.

ARTICLE VII - WORK DAYS ORDERED

Position	Work Days
1. U.S.Expert/Team Leader	24
2. U.S. Expert	18
3. Indian Expert	18

Work days include interviews with Sanders International, USAID/W, and U.S. collaborating firms in the United States by the team leader; travel from United States to New Delhi by both U.S. experts, travel to New Delhi by the national specialist, stay and work in New Delhi of all team members, travel within India by team members for interviews with TEST's partners (primarily ICICI), customers, and end users. The team leader should submit a final report prior to his/her departure complete in substance and satisfactory to the Mission team.

As mentioned earlier, the technical qualifications and experience required for the evaluation team is attached in Annex II.

ARTICLE VIII - USAID ILLUSTRATIVE BUDGET

See Attachment 'A'

ARTICLE IX - SPECIAL PROVISIONS

A. DUTY POST

New Delhi

B. LANGUAGE REQUIREMENTS AND OTHER REQUIRED QUALIFICATIONS

English

C. ACCESS TO CLASSIFIED INFORMATION

The Contractor shall not have access to any Government classified material.

D. LOGISTIC SUPPORT

USAID/India will provide background material and office space to the team. All other logistics and secretarial support must be arranged by the contractor.

E. WORK WEEK

A six-day work week is authorized.

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Annex II

Technical qualification and experience requirements for the evaluation team

The contractor will provide US and Indian specialists to perform the technical services outlined in the SOW. The team will include the following specialists:

A. US Specialists

(i) **Environmental Development Specialist** ; will be the team leader with overall responsibility for the evaluation. S/he will be responsible to prepare the final report, coordinate efforts with other team members to ensure adherence to evaluation approach and time lines, and will meet all reporting requirements. S/he should be familiar with: (1) AID project design and evaluation procedure; (2) environmental management issues in the Asia Region (particularly India); (3) private sector international trade related to introduction of environmental equipments and services; and (4) financial and economic analytical skills on environmental projects.

(ii) **Industrial Environmental Technologist** ; will be the primary team member responsible for reviewing the environmental technology and service component of the project. S/he should have both breadth and depth of knowledge about US pollution control and prevention technology, and ability to evaluate the application of US environmental technology and service in emerging markets. S/he should have extensive experience in industrial environmental management particularly in establishing commercial business alliances to capitalize on nascent market opportunities in developing countries.

B. Indian Specialist

Environmental Management Specialist ; should have knowledge of pollution control equipments, process design, waste minimization and integrated resource efficiency measures. S/he should have experience of reviewing the approaches and technologies adopted to determine how appropriately the environmental problems in India have been addressed. S/he should also be familiar with the current status and emerging trends in industrial environmental problems and appropriate cleaner technology options for India. The incumbent should also be conversant with the GOI policies regulations, acts and have excellent contacts in

the government and industry in India.

Appendix 16

ICICI, Criteria for Assistance in the Form of Loans and Conditional Grants to Companies

(excerpt from document entitled, Trade in Environmental Services and Technologies (TEST) Programme) (September 1993)

Appendix 16

ICICI, Criteria for Assistance in the Form of Loans and Conditional Grants to Companies (excerpt from document entitled, Trade in Environmental Services and Technologies (TEST) Programme) (September 1993)

THE INDUSTRIAL CREDIT AND INVESTMENT CORPORATION OF INDIA LIMITED

Trade in Environmental Services and Technologies (TEST) Programme

The implementation of the TEST Programme is expected to bring about following specific improvements :

1. an increased use of U.S. technologies, services, and equipment;

2. strengthened information network linking American suppliers and Indian users; and

3. Higher productivity due to reduction in pollution.

I. Criteria for assistance in the form of Loans and Conditional Grants to Companies:

1. It is proposed to offer assistance to environment related projects. The projects in the following broad areas would be preferred for financing under TEST :

   a. Water pollution control
   b. Air pollution control
   c. Solids waste handling and disposal
   d. Hazardous waste management

2. It is proposed that priority may be given to the major technology and service gaps existing in India, in order to maximise the impact of TEST programme on India's environmental problems. Loans and Conditional grants would be provided for acquiring environmental services, technologies and equipment from US sources or from Indian firms with US linkages.

3. It is proposed that the projects under TEST would focus on:

   a. Cleaner technologies;
   b. A strengthened environmental services sector;
   c. Providing infrastructural and information network facilities;
   d. Technologies with reusable by-products or reduced water and energy use;
   e. Waste minimization and reduction of pollution over a period of time; and

f. Reducing the negative impact created by excessive industrial pollution, on the industrial centres as well as on the ecology as a whole.

4. It is anticipated that proposals submitted under TEST will have the following characteristics:

a. Projects which assist in the establishment of facilities with U.S. collaborations (joint ventures, licensing agreements) for manufacture of pollution control or abatement equipment, including instrumentation for monitoring and analysis. The equipment proposed to be manufactured should have proven capabilities to reduce pollution and meet the standards established by the statutory authorities.

b. Projects to enhance the capacities of new or existing Indian consulting firms with U.S. linkages offering engineering and other services in the area of environmental technologies and services. Illustrative (but not exclusive) examples of services are:

- Feasibility studies;
- Risk assessment/management;
- Environmental audit;
- Environmental Impact Assessment studies; and
- Accessing evironmental information.

c. Projects which promote use of cleanor process technologies and increased productivity of operations through procurement of equipment and services with linkages to U.S. technologies. This may be (but is not limited to) in the form of:

- Reuse/recycle of waste water;
- Recovery of chemical resources from process waste streams;
- Reduction of colour/odour and BOD/COD loads in waste water;
- Efficient burning of boilers to reduce ambient emissions and reduced use of fuels;
- Reduction of particulates, SOx and NOx emitted to atmosphere from industrial processes; and
- Treatment and disposal of hazardous waste.

5. It is proposed that, to qualify for a Conditional Grant, a project must demonstrate that there is a need for adaptability of the US technology to the Indian environment or that there are significant additional costs or risks to the first time/pioneer venture to make it tenable for general lending mechanisms. The project must also suggest clear opportunities for successful technology commercialisation.

II. PROPOSED TERMS & CONDITIONS FOR ASSISTANCE IN THE FORM OF LOANS

The loans would be provided on the main term. and conditions as follows :

1. Interest

The interest rate will be determined by market forces, due to the availibility of finance from various sources. An indicative interest rate is 15.5% p.a., as is prevailing in the case of the IBRD line of Credit in the field of Pollution Control (also being managed by ICICI). To determine the market rate for TEST, ICICI wi11 make a

Appendix 17

ICICI, Policy Note for Grants to Trade and Professional Associations (September 1996)

Appendix 17

ICICI, Policy Note for Grant to Trade and Professional Associations (September 1996)

THE INDUSTRIAL CREDIT AND INVESTMENT CORPORATION OF INDIA LIMITED

Trade in Environmental Services and Technologies (TEST) Programme

Policy Note for Grants to Trade and Professional Organisations

Purpose

The grants to trade and professional organisations are aimed at helping these organisations to educate/serve their members by organising various activities for increasing awareness regarding environmental protection and productivity on sustainable basis.

Eligible Applicants

1. Apex bodies such as CII, ASSOCHAM, FICCI;
2. Industrial sector associations such as IAPMA, ICMA;
3. Trade associations and chambers of commerce;
4. Non Governmental organisations such as WWF; and
5. Professional associations/organisations.

All these would have proven record in the areas of interest for which the grant is being sought.

Priority areas of assistance

1. Information on environmental/investment regulations, government policies, issues and on line update.
2. Information on providers of U.S. environmental services and technologies.
3. Specific industrial sectoral studies for identifying technology gaps to be bridged through TEST.
4. In-house capability strengthening for better service to members.
5. Upgradation of Technical information/data.
6. Case Studies and Market trends for various aspects of clean business, pollution prevention, minimisation, abatement, treatment and disposal methods.
7. Seminars/Workshops - sponsoring technical information dissemination.

Criteria for selection

1. The organisation should have larger reach.
2. The assistance should have appreciable impact attainable within reasonable time span.

Amount of grant

The amount of grant will be decided by ICICI, taking into account the activities proposed, budget and other relevant aspects.

Evaluation of proposals

ICICI-TEST group would review the proposal and its impact. If necessary, the group may undertake field visits. If found supportworthy, the proposal would be put up for sanction.

Documentation and reporting requirements

1. The grant will be disbursed only after compliance of predisbursement conditions, if any.
2. The disbursement will be made in one or more installments, at the discretion of ICICI-TEST Group, on attaining specific benchmarks and deliverables, mutually agreed to at the time of sanction.
3. The organisation receiving grant will submit progress reports and final report as stipulated by ICICI-TEST Group.
4. ICICI and USAID will have a right to visit the organisation assisted for review.
5. If the progress is unsatisfactory, ICICI reserves the right to take suitable action including suspension of further disbursement of grant.
6. The grant would be subject to financial audit as per USAID guidelines.

Appendix 18

TEST LOGICAL FRAMEWORK MATRIX

	TRADE IN ENVIRONMENTAL SERVICES AND TECHNOLOGIES (386-0530)		
	REVISED LOGICAL FRAMEWORK MATRIX		
NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Sector Goal:	Measures of Goal Achievement		
Increase environmental protection and enhance the productivity of Indian industry on a sustainable basis.	Improved environmental practices of industrial operations within the project focus.	Selective evaluation/monitoring of specific operations.	Increasingly effective public pressure for stricter environmental standards.
	Increased number of private sector firms engaged in providing environmental services and equipment.	Case studies of assisted industries.	Increasingly effective laws, regulations and enforcement by the Union and State Government.
	Increased number of commercial transactions in providing environmental services and equipment.	Selected surveys of private sector firms.	Industry will recognize the economic and financial advantages of sound environmental practices and will increasingly internalize such practices in the cost of production.
Project Purpose:			
Assist Indian industries to adopt environmentally	Level of investment in environmental technology and services in selected sub-sectors.	Industrial practices surveys.	Industry willing to make necessary capital investment for long term gains.

sound practices while promoting sustainable linkages between U.S. and Indian firms.	Introduction of new technologies and practices.	Site visits.	Availability of U.S. technology at competitive prices.
	Upgrading specific industrial units and practices.	Available economic data.	
	Repeat sales of U.S. goods and services.		
	Increasing U.S. investment.		
Outputs:			
Increased use of U.S. sourced technologies and services.	New applications of U.S. sourced ESTs in India.	Surveys and site visits.	Initial import of U.S. goods and services prove successful and have "spread effect".
Improved pollution control equipment and services in project related industries.	Number of associations in the system and number of referrals to individual firms.	Tracking of requests and information services supplied by the network services.	Sufficient U.S.companies interested in doing business in India.
A strengthened information network linking U.S. suppliers and Indian users in a two way flow of information.	Number of U.S. and Indian firms with commercial transactions.		Organizations in the U.S. and India who will maintain the information network.
Increased number linkages between Indian consumers and U.S. suppliers.	Established links with U.S. environmental organizations.		
Inputs:			
$20,000,000 for import of U.S. goods and services.	Draw down of funds.	Available import data.	FX availability will remain a medium term concern.
Rupee environmental fund.	Services performed, equipment purchased.	Reports from implementing financial institution.	ESTs will be in demand by business. GOI
1. Establish information network.		USAID Controller records.	liberalization policies will continue.

2. Provide consultancy services.			Competent U.S. firms can be recruited.
3. Carry out workshops, study tours, training programs.			Qualified Indian financial institution will agree to manage Project.
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Appendix 19

U.S. SURVEY QUESTIONNAIRE AND TABULATED SURVEY RESPONSES

TRADE IN ENVIRONMENTAL SERVICES AND TECHNOLOGIES (TEST) PROJECT

QUESTIONNAIRE FOR U.S. COMPANIES

(Response requested by November 22, 1996)

To: Export Manager, COM, PRIFAX

Fr: Joan Favor, Assistant Vice President, Management Systems International

Re: **Evaluation of the Trade in Environmental Services and Technologies (TEST) Project**

The purpose of this survey is to obtain the views of U.S. companies about the Trade in Environmental Services and Technologies (TEST) Project, a bilateral activity between the U.S. Agency for International Development (USAID) and the Government of India. TEST is intended to promote the use of U.S. equipment and services to reduce industrial pollution and improve environmental efficiency in India.

Management Systems International (MSI) is conducting a mid-term evaluation of TEST for USAID. Sanders International, the U.S. contractor implementing TEST, has identified your company as one which has: (1) contacted TEST; (2) received information from TEST; or (3) been an active participant in TEST. The views of U.S. companies are important for evaluating how well the TEST project has worked so far, and what improvements are needed. We would very much appreciate your response to the following questionnaire, which has been designed to be quick and easy to complete. Companies with very limited involvement with TEST may only wish to complete Questions 1-5. All responses will be kept confidential; individual responses will not be shared with USAID, the Government of India, or Indian companies participating in TEST. Please fax responses by Friday, November 22, if possible, to: Paul Diffenbach, MSI, 202-488-0754 (fax)/ 202-484-7170 (phone). Thank you very much for your assistance.

1. How did your company learn about the TEST project?

___Promotional mailing ___Trade fair ___Direct contact from TEST contractor
___Internet web site ___Indian company ___Other (pls. specify) _____

2. What TEST Project resources has your company (or your Indian customer/partner) used and how effective were they?

	Which company used the service			Effectiveness of the service				Approx. date(s) of service
	U.S.	Indian	Both	Excellent	Good	Fair	Poor	
___Technical assistance	___	___	___	___	___	___	___	199____
___Trade/investment tours	___	___	___	___	___	___	___	199____
___Business facilitation	___	___	___	___	___	___	___	199____
___Information networks	___	___	___	___	___	___	___	199____
___Loans	___	___	___	___	___	___	___	199____
___Conditional grants	___	___	___	___	___	___	___	199____

3. Has your company used the TEST Project home page (http://www.info.usaid.gov/TEST/)?
___Yes ___No. If yes, please rate the usefulness to your company:

___Excellent ___Good ___Fair ___Poor Comments _____

_____

4. To what stage has your participation with TEST proceeded?

___Initial contact only ___Business exploration proceeding ___Negotiating a sale
___Completed sale ___Negotiating a joint venture ___Completed joint venture
___Other (pls. specify)_____

5. If your company's participation with TEST did not proceed to a sale, joint venture or other commercial transaction, why did it not proceed? (Please check all applicable responses.)

___Did not find a good match ___Found a good match, but Indian company withdrew
___Not comfortable with pursuing business in India ___Not satisfied with TEST services
___Reasons unrelated to TEST or India. Please give more specifics, if available, about the reasons checked: _____

_____

6. If you provided/intend to provide environmental equipment or services to India:

a. What is(are) the type(s) of equipment or service? _____

b. What is your assessment, if available, of the market for such equipment or services in India? _____

c. What is your impression of the competitiveness in India of such equipment or services provided by U.S. companies (as compared to companies from other nations)?

___Excellent ___Good ___Fair ___Poor Comments _____

7. Have you used other public or private services to facilitate environmental business links with India?

a. ___Yes ___No If yes, pls. specify _____

b. If yes, did you find that the other services and TEST:

___Complemented each other ___Duplicated each other. If there was duplication, please provide any suggestions _____

_____

c. If you used services other than TEST, how did TEST compare to them overall?

___Excellent ___Good ___Fair ___Poor Comments _____

_____

8. From your company's perspective, how effective has TEST been with respect to:

a. Understanding the Indian environmental market and related business opportunities

___Excellent ___Good ___Fair ___Poor ___Uncertain ___Not applicable Comments _____

_____

b. Identifying and/or facilitating an environmental business opportunity in India?

___Excellent ___Good ___Fair ___Poor ___Uncertain ___Not applicable Comments _____

_____

c. Promoting ongoing growth in Indo/U.S. Linkages for your company, extending beyond the current transaction(s) that your company is experiencing or implementing?

___Excellent ___Good ___Fair ___Poor Comments _____

d. Overall, promoting effective Indo-U.S. linkages for environmental business?

___Excellent ___Good ___Fair ___Poor ___Uncertain ___Not applicable Comments _____

_____

9. Have recent changes in environmental policy, economic liberalization, and/or institutional conditions in India affected your interest in Indo-U.S. environmental commercial linkages?

___More interested ___Less interested ___No effect ___Uncertain ___Comments _____

_____

10. Please provide any additional comments about the strengths and weaknesses of the TEST Project, and how it could be improved. Also, please note any needs your company has for improved environmental business linkages with India that are not being fulfilled by TEST or other programs. _____

_____

_____

_____

_____

_____

_____

TABULATION OF RESPONSES RECEIVED TO SURVEY OF U.S. COMPANIES FOR TEST

MID-TERM EVALUATION

1. How did your company learn about the TEST project?

___Promotional mailing_2_Trade fair_6_Direct contact from TEST contractor
___Internet web site_2_Indian company ___Other (pls. specify) _____

2. What TEST Project resources has your company (or your Indian customer/partner) used and how effective were they?

	Which company used the service			Effectiveness of the service				Approx. date(s) of service
	U.S.	Indian	Both	Excellent	Good	Fair	Poor	
___Technical assistance	1	___	___	1	___	___	___	199____
___Trade/investment tours	___	___	2	2	___	___	___	199____
___Business facilitation	2	1	3	3	___	1	___	199____
___Information networks	3	___	___	3	___	___	___	199____
___Loans	2	___	___	1	___	___	___	199____
___Conditional grants	___	1	___	___	1	___	___	199____

3. ___Yes_5_No.

If yes, please rate the usefulness to your company:

_1_Excellent ___Good ___Fair ___Poor

Comments:

Now reviewing possible linkage to its' Home Page.

4. __2__Initial contact only__5__Business exploration proceeding ___Negotiating a sale
___Completed sale__1__Negotiating a joint venture ___Completed joint venture
__1__Other (pls. specify)__**Developing Marketing Plan for Drinking Water System**__

5. ___ Did not find a good match__1__Found a good match, but Indian company **(lengthy delay)** withdrew
___Not comfortable with pursuing business in India__1__Not satisfied with TEST services
__3__Reasons unrelated to TEST or India.

Please give more specifics, if available, about the reasons checked:

Our business dealings are tied to the success of other Indian Projects. The parties are still interested and a successful arrangement is still possible.

Stll in Process.

Have had no further contact until the _____ or fax received 11/15/96 from initial contact on 5/29/96.

Indian market so slow -- may yet come to fruition. Hindustan Motors Diesel on test here in USA.

6.a.
Comments:

Would like to sell foundry equipment.
Pollution control system.
Catalytic converters for auto/diesel/motorcycle.
Waste treatment engineering design/services for solid/liquid sludges (industrial/hazardous); water treatment.

6.b.
Comments:

The market should be great.
Good.
Expanding as laws are passed.
Market limited to Guthrat, Maharashtra, Delhi area and possibly Tamil Nadu; (it is pursuing commercial/private sector work)

6.c. **1** Excellent **2** Good **1** Fair ___ Poor
Comments:

In every instance, maximization of Indian content will be needed and long-term must be establishment of Indian JV through which to remain competitive.

7.a. 3 Yes 1 No

If yes, pls. specify:

We have joint venture currently active in India.
Pradushan controls Jamshadpur.
WEC (1994), US-AEP (correspondence only).

7.b. 2 Complemented each other ___Duplicated each other. If there was duplication, please provide any

Suggestions:

Make test the lead and focus for all department/agency efforts.

7.c. 1 Excellent ___Good ___Fair ___Poor

Comments:

No duplication - Pradushan will need loan for license manufacturing of U.E.C. Products.

8.a. __2__Excellent__2__Good _Fair _Poor _Uncertain _Not applicable

Comments:

8.b. __2__Excellent__1__Good _Fair _Poor _Uncertain _Not applicable

Comments:

Not used to identify-good for facilitating-only problem slow Indians.

8.c. __2__Excellent ____Good__1__Fair _Poor

Comments:

Early days but responsive and well informed.

8.d. __2__Excellent__1__Good__1__Fair ____Poor ____Uncertain ____Not applicable

Comments:

9. __2__ More interested _____Less interested__2__No effect _Uncertain__1__

Comments:

India is not a prime "focus" country for it; with Test's help, perhaps it may become one!

10. **Comments:**

The weakness lies with the Indian companies doing something, anything. Sanders International has done an excellent job in attempting to get this project off TDC, but as yet to no avail. We are hopeful for better results in the future.

We were not involved directly with Test, it was our client who received a grant from Test.

Sanders International made the necessary arrangements at Indian end. The were responsive, interested and checked with us on a regular basis.

1. Establish clear leadership role. 2. Provide funding for strategic rather than tactical effort. 3. Set clear goals and assess performance against these goals.